

An analysis of group decision justification and its
implications for GSS use and design ideals

**AN ANALYSIS OF GROUP DECISION JUSTIFICATION
AND ITS IMPLICATIONS FOR GSS USE
AND DESIGN IDEALS**

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Submitted in fulfillment of the requirements for the degree
Philosophiae Doctor (Information Technology)

in the

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at the

University of Pretoria

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Pretoria, South Africa

May 2011

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by

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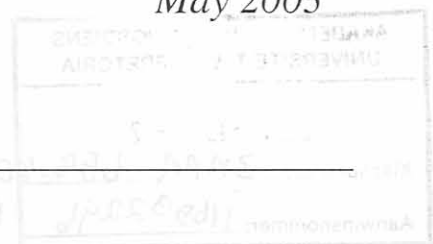
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May 2003



I declare that

Acknowledgements

An analysis of group decision justification and its implications for GSS use and design ideals

Is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

LJ Phahlamohlaka

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Abstract

An analysis of group decision justification and its implications for GSS use and design ideals

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DEGREE: PhD (Information Technology)

In making decisions, modern organisations increasingly rely on groups. The processes that such groups go through in arriving at those decision are very complex. The complexity of these processes mean that irrespective of the level of expertise of each group member, it may be difficult for groups to describe and explain to others the audit trail of their decision process. This thesis argues for and demonstrates that the introduction of the concept of justification to group decision-making substantially enhances our understanding of this complex process.

A multi-theoretic framework is used at three levels of analysis - the systemic, hermeneutic and interpretive levels of data obtained through a process-based research framework and transcripts of GSS use sessions.

Drawing on practical philosophy, critical systems thinking and hermeneutics, a decision justification social practice is proposed - a social practice that determines and prescribes a group decision justification schema on the basis of which a group decision justification support system could be designed and developed. The design of the proposed justification support system opens up new research avenues and aligns with current perspectives on thinking patterns and interpretive approaches to GSS research. In turn, the group decision

justification schema informs and directs the *justification social practice*. The result is a *group decision justification framework*.

Chapter 1

This research was conducted as follows: The literature and the nature of the research topic pointed us to the appropriate research methodology. Two sets of primary research questions together with secondary questions were raised using a process-based research framework. A research framework which guided the research as a whole was then developed and a detailed theoretical grounding of the research framework and how it would be used to further guide the analysis was presented. Empirical data was then collected and analysed in an interpretive way informed by the multi-theoretic analysis framework embedded within a hermeneutic circle. From the theoretical and empirical analyses emerged a decision justification social practice and a decision justification schema, which together constitute the final group decision justification framework. The evaluation of the study, limitations as well as areas of further research are discussed in conclusion.

Decision justification framework, Group decision-making, Group Support Systems(GSS), GSS design ideals, Interpretive information systems research, Systemic-hermeneutic-interpretive framework, Decision justification social practice, Practical philosophy, Grids of Interpretation, Framework Schemes.

Chapter 1

Introduction

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Chapter 1

Introduction

1.0 Introduction

This thesis argues for and demonstrates that the introduction of the concept of justification to group decision-making substantially enhances our understanding of this complex process and reduces the problem of post-decision anxiety. As the world yearns for democratic ideals - ideals that represent the highest aims and aspirations of human kind, there are increasing desires that institutions of authority that enable people to act and make decisions on behalf of others must open themselves up to critical public scrutiny without inhibiting those individuals or groups from exercising such powers. There is therefore a need for upfront, socially well-understood and institutionally sanctioned processes of decision justification in order to guide those involved in the decision-making process. In contributing towards the pursuit of this goal, *a group decision justification framework*, which encompasses a decision justification social practice, is proposed in this thesis. The framework could be used as a guide as to how such a social practice could be brought about and supported through a particular form of design and use of group decision support systems. We do not, however, claim that the framework is the only possible one, only that it is theoretically and empirically well informed as well as practically feasible in situations where justification of group decisions are called for.

1.2 Thesis topic and its rationale

In proposing *a group decision justification framework* in this study, we do not deny the fact that human beings are purposive and know a great deal about why they act in the way they do, and that they can and do provide rationales for their actions and interactions if asked (Giddens, 1984). We also acknowledge the fact that in practice people are not

always asked to explain their actions. However, when actors act or are perceived to act in a way that affect others, or act contrary to our normal expectations, such as making decisions which negatively impact on others, such assumed competence cannot be left unchallenged. There are many instances when we need detailed explanations as to *why* and *how* certain decisions have been made. When this happens, it is important that those affected be put in a position where they can judge for themselves that a reasonable attention has been given to their cause. At the same time, a suitable ‘inoculation’ process of building up a more adequate body of reasons in advance of a serious challenge may be helpful to those challenged. This will allow them to develop critical faculties in a way that prepares them to deal more robustly with future attacks on their future decision processes (Toulmin *et al.*, 1979).

We describe *justification social practice* as the ability and willingness on the part of those involved and those affected to set boundary judgments and to translate those judgments into their own rational and cogent argumentation within a well defined institutional and procedural arrangement for rational debate (Ulrich, 1991).

Traditional decision theories and models such as those of Simon and Weber could have benefited from an explicit introduction of the concept of justification into the decision-making process. The argument for not doing so seems to be that the meaning of a decision can be traced in the objective circumstances, in the value premises and preferences of the actor, in the act of selecting alternatives, and so on. This thesis argues that there is an omission in these arguments and suggests a revisiting of these theories and models with the concept of decision justification in mind. We argue and demonstrate that the introduction of the concept of decision justification substantially enhances our understanding of the decision-making process. Because decision-making models such as those of Simon have greatly influenced major areas of the information systems field, such as Artificial Intelligence (AI), Decision Support Systems (DSS) and Management Information Systems (MIS) (Ciborra, 1999), such an enhanced understanding is likely to

have positive theoretical and practical consequences for these areas. Sadly, the mainstream of decision theory left this topic to practical philosophy. For this reason, the arguments presented in this study are rooted in practical philosophy, informed by practical philosophers such as Jürgen Habermas, David Gauthier, Michel Foucault, Thomas Kuhn and Stephen Toulmin but closely align with those of phenomenologists such as Bergson, Schutz and Garfinkel, who argue that the *in-order-to* component in rational decision-making is just the tip of the iceberg. Below, there are the actor's past experiences - selectively evoked according to the existential circumstances valid at the moment of making the decision. These are constitutive meanings - the *because-of* component of the action that can explain the reasons why and how a situation has been perceived as problematic in the first place. The decision justification social practice is aimed at assisting the decision makers as well as those affected by the decision to access these *because-of* components, which are only selectively and circumstantially evoked. A better understanding of these deeper layers of the social practice would enable better designs of computer-based systems aimed at supporting these processes.

1.3 Organisation of the study

In *Chapter 2* we begin our study by exploring in detail the work done by previous researchers. In doing so, we identify the *primary research questions* relevant to our investigation as well as introduce some of the basic concepts, vocabulary, approaches and the underlying philosophical arguments. We also present some of the underlying epistemological and ontological perspectives on our topic and discover the links which will further guide the analysis. Our *research purpose* is stated in two legs; the first is that of seeking 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. The second leg of the purpose is that of finding out what the implications of this introduction are with respect to the use and design ideals of group decision support systems.

In *Chapter 3* the research approach and method followed in the study are described. Some of the key guiding arguments on the choice of a research method in information systems research are presented and discussed. A research framework to be used in guiding the research as a whole is constructed. In addition to the primary research questions raised earlier in chapter 2, secondary research question are generated in accordance with the process-based research approach described by Roode (1993). In seeking responses to the primary as well as the secondary research questions, we discuss the appropriateness of using different theoretical perspectives, with empirical data analysed using an interpretive approach.

Chapter 4 discusses the theoretical foundation of the study. This is the most important chapter which could give the reader a somewhat complete theoretical picture of the entire study. A multi-theoretic analysis framework based on the hermeneutic philosophy is constructed and presented. In order to operationalise the framework, it is decomposed into five interpretive schemes embedded in a hermeneutic circle. A brief description of how each scheme would be used to seek an understanding of both the group decision-making and the decision justification processes is presented. Because decision justification is multi-dimensional in nature, multiple lenses would be used to illuminate the various aspects of the process, as no single lens would be sufficiently robust to illuminate all the aspects that could be at play in the process. A set of principles for conducting and evaluating interpretive field studies in information systems proposed by Klein and Myers (1999) are briefly discussed in addition to those proposed by the author.

In *Chapter 5* the research design is discussed, an extensive amount of data is presented and the results are interpreted using the analysis framework developed in chapter 4. Three data sets are presented. The first set is obtained from key informant representatives of groups through a survey-like (open-ended and non-quantitative) questionnaire, while the second and third are obtained from master of commerce students through *interpretive GSS experiments*. We present a detailed account of why we have designed our research in

the way we did, while pointing out some limitations. In analysing the data, we created new ways of interpretive analysis, using new concepts such as *grids of interpretations* and *scripts*. Two important benefits emerged from the analysis framework. The first was that it enabled us to make multiple interpretations of the same data sets and the second was that it enabled us to identify areas where one theory better illuminated an aspect of the data while the other did not. Some observations from the analysis of GSS use sessions are discussed and related to design ideals from the GSS literature. From the analysis presented in this chapter emerged a *group decision justification framework*. We also revisit and discuss how the *research questions* have been responded to.

Chapter 6 is the conclusion of the study. It draws on the literature and the rest of the analysis and starts by presenting the prerequisites for decision justification. It then discusses the enhanced understanding of group decision-making when group decisions have to be justified. This is accomplished by revisiting the theoretical lenses that constituted the analysis framework used in the study. Based on the empirical evidence presented in chapter 5, suggestions are made as to how these lenses could usefully be adapted for decision justification environments. The implications for GSS use and design ideals informed by Toulmin *et al.*'s schema of reasoning, symbolic interaction and thinkLets are discussed. Finally and in conclusion, we discuss some critical reflections and an evaluation of the study in terms of its quality and the contribution it makes to information systems research. Some limitations and areas of further research are discussed, followed by brief concluding remarks.

Chapter 2

Literature Review

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Chapter 2

Literature Review

2.0 Introduction

Decision-making by individuals is a very strange phenomenon. We have observed over the years that when individuals are asked *why* they have made certain decisions, explanations seem to be quick. But when they are asked to explain *how* they have arrived at such decisions, they usually shuffle and do not seem to find explanations that easily. But because individuals have feelings, intuition and can simply draw on these as well as their lived experiences enabling them to make judgments, they do somehow find ways of explaining. This phenomenon of people ‘appearing’ ‘not capable’ of explaining in detail how they have arrived at certain decision has intrigued us for sometime, but more so when the same notion is extended to decision-making groups. One would have expected that certain decisions, especially those with social implications would always require those making them to be readily capable of justifying them. This does not seem to be the case. Could it be that human beings just make decisions which may have social implications without them anticipating to be asked to justify them? If the answer is no, then why do people ‘appear’ ‘not capable’? (observations). If the answer is yes, then surely there must be some historical evidence of efforts made to correct the situation, or an explanation somewhere indicating why it is difficult to do so, and how such a difficulty could be dealt with. At the same time, it does not occur to us that such signs of being ‘incapable’ are deliberate or intentional. There must be more to this, and we approach this literature study with these questions in mind. Maybe this only shows that human decision-making is indeed a very complex process. Perhaps the best we can do as inquirers into this complex human activity, is to continue to identify and concentrate on those specific aspects which

stimulate our thoughts, capture our imagination and are of most interest to us. We have identified group decision justification as one such aspect.

We are interested in 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. In addition, we are also interested in finding out what the implications are of introducing the justification concept, with respect to the use and design ideals of group decision support systems.

*Based on the observations cited above, we are assuming that the concept of decision justification does **not** form part of decision-making in general, and group decision-making in particular, or if it does - it is very illusive.*

We begin our study by exploring in detail the work done by previous researchers. In doing so, we identify some of the research questions relevant to our investigation as well as introduce some of the basic concepts, vocabulary, approaches and the underlying philosophical arguments.

We present in this chapter some of the underlying epistemological and ontological perspectives on our topic and discover the links which will guide our further analysis. The topic of our research is:

An analysis of group decision justification and its implications for GDSS use and design ideals

What follows is an elaborated exposition of the relevant literature.

2.1 Understanding Group Decision-making in Organisations

Ngwenyama *et al.* (1996) note that generally, decision-making groups follow a set of agreed upon rules for the process they would like to follow in arriving at a decision on an issue/problem. It is an issue/problem under consideration which brings the group together, although in most recent instances it is organisational requirements. Ngwenyama *et al.* (*op.cit.*) further point out that the urgency, complexity, and frequency of problems confronting organisations necessitates participation of groups of individuals who have a wide range of skills, perspectives, and values. One could go further to say that in organisations; decisions are almost always made by groups. Even in instances where it appears as though individuals have made such decisions, such individuals have to a large extent been informed by an established group. This makes the study of group decision-making important as these decisions often have significant consequences. Group decision-making in government and industry, for example, can influence our lives in many ways, such as through the establishment of laws and rules and the determination of how much we are paid for our work (Guzzo (1982)). Guzzo describes the study of group decision-making as fascinating as well, because the actions of decision-making groups can be puzzling and unpredictable.

The history of the systematic study of group decision-making aligns closely with the history of the study of group dynamics in general. Only relatively recently, however, has group decision-making study received considerable attention. According to Guzzo (1982, p.3), its complexity calls for the development of theory as it is composed of numerous dynamic, interdependent elements, necessitating an interdisciplinary approach. He identifies two major issues to be addressed in the study of group decision-making; regardless of the particular theoretical orientation of the researcher:

- The processing of information
- The social-psychological dynamics of behaviour.

Information processing includes collecting and evaluating information, determining alternative courses of action, and selecting one as preferred. The social-psychological dynamics of behaviour refers to different forms of interaction among group members. A strong mutuality of influence between information-handling activities and social psychological forces has been identified. Guzzo (*op.cit.*) notes further that how information is acquired and evaluated can limit the nature of the social interaction. He cites the use of Nominal Group Technique (NGT, Delbecq, Van den Ven , & Gustafson, 1975) as limiting to social interaction and a syndrome called “group think” as resulting in flawed information processing due to social-psychological forces for concurrence seeking among group members.

In line with these two issues to be addressed in the study of group decision-making, it is perhaps appropriate at this stage to raise the following questions:

- *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 modelled in a way that could inform the design 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 the four primary research questions of this thesis. We will revisit them together with other secondary questions in the next chapter. As indicated earlier, we are interested in 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. In addition, we are also interested in finding out what their implications are with respect to the design ideals/ principles of group decision support systems.

Cook and Hammond (1982), drawing from a conclusive research by Slovic and Lichtenstein (1971), identified the difficulty in communicating judgment policies by group members as problematic. They note that if decision makers have a poor understanding of their own judgment policies and are unable to describe these policies accurately, it is not surprising that communication between decision makers about complex issues is a highly fallible process often resulting in misunderstanding and conflict. In a decision-making group, group members make trade-offs in arriving at a decision. Being able to justify how they make those trade-offs would be helpful to the entire group. Social Judgment Theory (SJT, Hammond, Stewart, Brehmer, Steinmann, 1975) deals with the task of integrating complex, probabilistic information from a variety of sources in order to arrive at a decision. Although quasi-rational in content and approach, SJT does provide a framework and methodology for analyzing the judgment of a decision maker and for communicating information about the decision maker's judgment to himself and others. Our interest is, however, on what one could call "substantiated judgments", not just pure judgments, which leaves little room for a challenge.

Numerous studies have attended to the information processing aspect of group decision-making, while relatively little has been done on the social-psychological aspect. The effect of introducing the concept of justification has been considered only in four traceable instances (De Hoog & van der Wittenboer, 1985; Haggafors & Brehmer, 1983; Bacharach, Bamberger and Mundell, 1995; Toulmin, Rieke and Janik, 1979). In

concluding their exploratory study on the logics of decision justification, Bacharach *et al.* (1995) argue that until we learn more about the criteria by which decision alternatives are evaluated and selected-and the logics of justification underlying these criteria - the “black box” in decision theory is likely to remain quite large.

The question of what comes first between *understanding the decision-making process* and the *decision support system* is well known in the Information Systems field (Mittman and Moore, 1984; Sprague, 1980; Silver, 1991). According to Silver (1991), quoting Markus and Robey (1988); Poole and DeSanctis (1989), decision support systems do not deterministically impose effects on decision-making processes. According to these authors, consequences emerge from interaction of the system with its environments. Based on this, Silver (1991) argues that studying the effects of DSS also requires a means of describing decision-making environments; and it requires process-oriented rather than outcomes-oriented studies. Introducing the concept of decision justification into the decision-making process would thus be expected to affect both the environment and the process itself. Seen from the general systems theory context (total system) as explained by Roode (1993), the question does not arise. They both constitute the total system as illuminated in the following definition:

“Information systems is an inter-disciplinary field of scholarly inquiry, where information, information systems and the integration thereof with the organisation is studied in order to benefit the total system (technology, people, organisation and society)”

Our contribution is to investigate the extent to which the total system may be made clearer through the introduction of the concept of justification. This will require us to look deeper into systems thinking literature, which we do in the next and subsequent sections of this chapter.

2.2 Introducing the concept of decision justification

In our day-to-day lives we are affected either directly or indirectly by decisions which are made by those with whom we interact, including those that are made by ourselves. The extent to which we become affected varies; depending on the societal level at which such decisions are made. We care very little when such decisions are consistent with our everyday lives and expectations. In aesthetic discussions, for instance, we do not point to undisputed data, facts, or grounds to support our aesthetic claims (Toulmin *et al.*, 1979 p. 51). We are content with what makes us “*feel*” good. In performing their daily tasks, managers ‘go on’ and do their work - making decisions - without really being too concerned about possibilities of being challenged to justify their decisions. It is the nature of their work - to make decisions - and they will continue to do so; guided largely by their own intuition, and what Giddens (1984) calls *practical consciousness*. According to Giddens, they are knowledgeable actors - and will usually be able to explain most of what they do, if asked.

Instances do occur, however, when we need detailed explanations as to *why* and *how* certain decisions have been made. It is not uncommon to find that no prior serious attention had been paid to the decision-making process, depending on the situation at hand. This *need* for decision justification arises very often, even at the highest levels of society. De Hoog and Van der Wittenboer (1986) noted:

‘Parliamentary systems of democratic governments are based on the principle that governments have to justify and defend their decisions before an assembly of representatives of the nation. Although the obligation to justify one’s decision occurs rather often, this phenomenon has not received much attention from decision theorists. Research tends to focus more on the limited cognitive information processing capability of the human decision maker, while the prevailing psychological viewpoint is that the “social” aspect of decision-making is being neglected.’

Hagafors and Brehmer (1983) have demonstrated that the *need* for people to justify their decisions or judgments causes them to function more analytically and improves their consistency in the decision-making process. However, these results were obtained from individuals as subjects of a well controlled laboratory experiment.

De Hoog and Van der Wittenboer go on to say:

“... the problem of whether the necessity to justify a decision influences the way the decision is made deserves more attention.”

Although most of their initial hypotheses about the expected behaviour of decision makers used in their experiment were refuted, the experiment conducted by De Hoog and van der Wittenboer contains some interesting results, which to a large extent inform our study. Their results are summarised as follows:

- The necessity to justify one’s decision *vis a vis* others has no effect on the kind of decision rules selected for arriving at a decision.
- The kind of information available during the decision-making process has a marked effect on the choice of decision rules, especially when the format permits an easy mapping between rule and information.
- Neither the need to justify nor different information modes influence the number of attributes used in the decision-making process.

In concluding this experiment, they called for more research on the selection of decision rules; noting that the “social” aspects of decision-making deserve attention and a more coherent theoretical framework. No evidence of any further study with a focus on the *need for decision justification* has been found to date.

Since low consistency has been shown to be an important obstacle to resolution of cognitive conflict in a group (Hammond and Brehmer, 1973), a deep insight and understanding of the *decision justification* process by *groups* has potential to make a substantial contribution to group decision theory and conflict resolution.

One needs to emphasise that although such a *need* to justify a decision does arise, it has to be *established*. This is because there is not *always* a basis for raising an “issue”. As Toulmin *et al.* (1979) put it, there has to be *grounds* for doubt and *occasions* for argument. There has to be something about a situation that provides an “occasion” for challenging somebody’s statements; there has, that is, to be something in the situation that gives rise to a *doubt* about the claims made in those statements.

Toulmin *et al.* (1979: 121) go on to say:

“.....that unless we can point to the things that create these grounds for doubt, we may simply find the people whose views or actions we are challenging sweeping our questions aside and replying that there is nothing to explain, apologise about, or justify. And they may, in many cases, be entitled to respond in just that way. What, then, is involved in deciding whether an issue really arises at all, in the first place?. Regardless of the context and type of argumentation, the question can always be asked: *Why does this particular position need to be justified?* ”

They argue that unless that question can be met – unless a genuine ground for challenging it can be recognised – the challenge, as such, will fail in *advance* of any critical discussion about its merits. We know that this is the case from our day to day experience. So the *need* for rational argumentation (justification) is *established* only after a genuine ground for questioning has been isolated and some reasons have become apparent for taking the proposed issue seriously. There is, however, the other side to this argument. Bacharach *et al.* (1995), note that decades of social psychological research suggest that one of the primary factors shaping human decision-making is the anticipation of post-

decision anxiety and the decision maker's consequent need to reduce it. They indicate that in organisations, a primary source of this anticipatory anxiety is *accountability*. Underlying every managerial hierarchy in complex organisations is some norm of accountability. Quoting Tetlock (1985, p.307), Bacharach *et al.* (1995) go on to say:

“Accountability is a critical rule and norm enforcement mechanism; the social psychological link between individual decision makers, on the one hand, and the social systems to which they belong, on the other. The fact that people are accountable for their decisions is an implicit or explicit constraint upon all consequential acts they undertake (if I do this, how will others react ?)”

According to this norm of accountability, in order to reduce post-decision anxiety, decision makers must be able to explain their decisions as justified and therefore legitimate. According to Bacharach *et al.*(1995), decisions must be justified not only to those whom the decision maker is directly accountable to, but also to others (e.g., peers, self, subordinates). Toulmin *et al.* (1979) agree with this by saying:

“It is helpful to start a suitable process of “inoculation”, by which we expose our most cherished ideas to systematic attack and begin on the task of building up a more adequate body of reasons in advance of a serious challenge. This may allow us to develop our critical faculties in a way that prepares us to deal more robustly with future attacks on our beliefs.”

The fact that decision theorists have so far ignored to explicitly include the concept of decision justification in their models, seem to suggest that this aspect of having to establish the need for it (Toulmin *et al.*, 1979) deserve more attention. Following Toulmin *et al.*'s arguments, one can see that the introduction of the concept of justification immediately poses a challenge to both the questioner (challenger) and the intended respondent (the challenged). The situation would be even more complex in a group setting. One could ask the question:

What would be the expected “behaviour” of a decision-making group within the context of decision justification?

The available literature indicates that an answer to this question is far from being clear. A common approach seem to be based on some application of rules (Tversky,1972; Adelbratt and Montgomery, 1980; Klein and Hirschheim, 1996; Poole, Seibold and MacPhee, 1985). From a structurational perspective as presented by Giddens (1984), structuration occurs as people draws on rules and resources to act, but one must never assume that a single act draws on a single rule. The meaning of any rule (or resources) is determined by other rules and resources to which it is related in social practice.

In part, the above questions can be addressed through Giddens’s concepts of *Action, Reflexivity, and Rationalization*; in what he calls the *stratification model* of the agent as shown in Figure 2.1.

The reflexive monitoring of action is a chronic feature of everyday action which involves the conduct of the individual and others. This means that actors not only monitor continuously the flow of their activities and expect others to do the same for their own; they also routinely monitor aspects, social and physical, of the contexts in which they move. The reflexive monitoring of behaviour operates against the backdrop of rationalisation of action - our ability to give account, to ourselves and others. We rationalise - make our conduct “rational”- in discourse, in socially prescribed terms.

Rationalization of action means that actors - also routinely and for the most part without fuss - maintain a continuing ‘theoretical understanding’ of the grounds of their activity. Giddens warns that having such an understanding should not be equated with the discursive giving of reasons for particular items of conduct, or even with the capability of specifying such reasons discursively. It is, however, expected by competent agents of others - and is the main criterion of ‘competence’ applied in day-to-day conduct - that

actors will usually be able to explain most of what they do, if asked. The rationalization of action, within the diversity of circumstances of interaction, is the principal basis upon which the generalized ‘competence’ of actors is evaluated by others. We view this ‘*demonstration of competence*’ as being of particular significance to our study because the literature cited above indicates that such ‘*assumed competence*’ is not always sufficient.

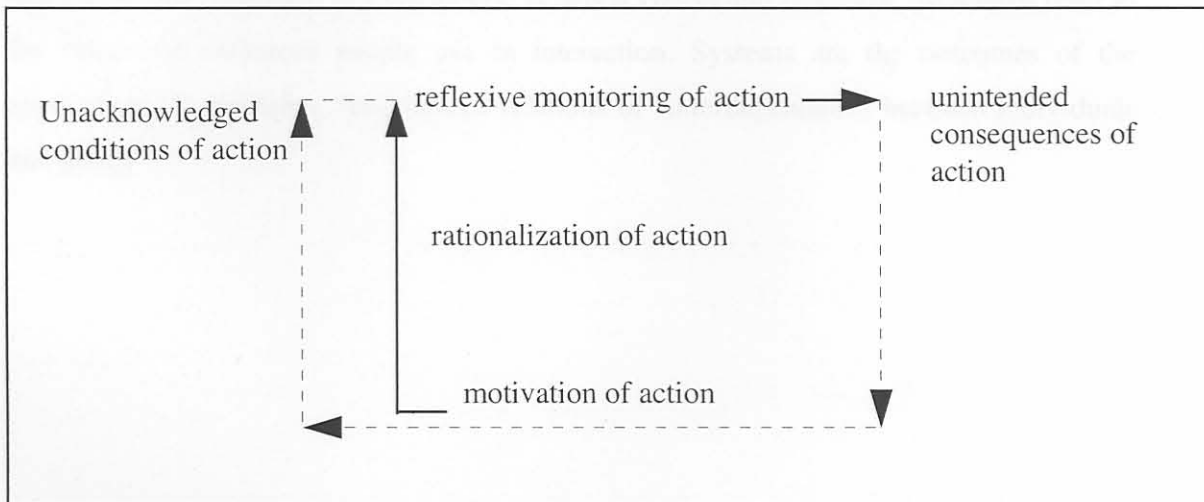


Figure 2.1: Giddens’ Stratification Model (Giddens, 1984, p.5)

Motives supply overall plans or programmes - ‘projects’ - within which a range of conduct is enacted. If reasons refers to the grounds of action, motives refer to the wants which prompt it. Motivation refers to potential for action rather than to the mode in which action is carried on by the agent. It is not bound up with the continuity of action as are its reflexive monitoring or rationalization.

According to Giddens, our day-to-day life occurs as a flow of intentional action (*duree*). However, acts have *unintended consequences*; and, as indicated in Figure 2.1, unintended consequences may systematically feed back to be the *unacknowledged conditions of further acts*.

In contextualizing the work of Giddens to group decision-making, Poole *et al.* (1985) noted that rationalization should not be interpreted as simple account giving. Accountability is a constituent feature of action and the need for accountability is a contextual condition of action that differs for different situations. This is in agreement with Toulmin's schema of reasoning that the need for justification has to be *established*.

If we assume that such a need for decision justification has been *established*, how would we then extend this argument to a group setting?. Can groups competently justify their decisions if asked? With the above notion of the concept of action, can we say that groups are able to "act", just like individuals would do in this context? Poole *et al.* (1985) looked at some aspects of this questions in detail from a structural point of view.

2.3 Group Decision-making as a Structural Process

Elements of the theory of structuration

In presenting his unified theory of structuration, Giddens (1984) provides its elements as shown in Figure 2.2. *Structuration* refers to the process of production and reproduction of social systems via the application of generative rules and resources, Giddens (1984). Implicit in this definition is a distinction between *system* and *structure*. Structures refer to the rules and resources people use in interaction. Systems are the outcomes of the application of structures, "regularized relations of interdependence between individuals and group".

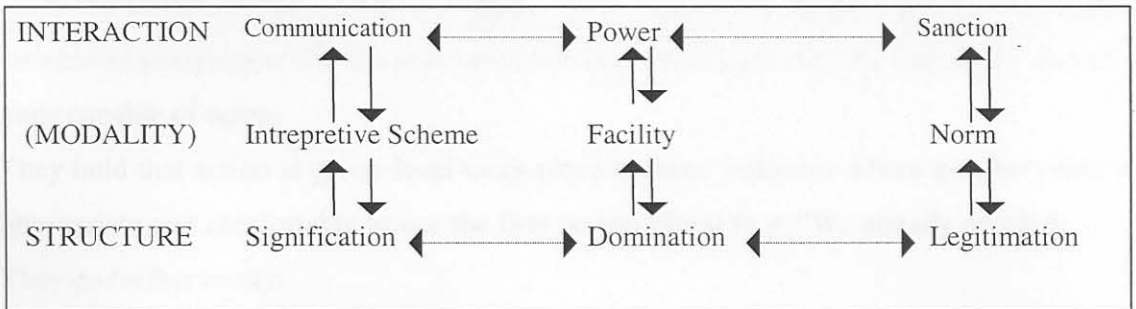


Figure 2.2: Elements of the theory of structuration (Giddens, 1984)

In the above diagram, the top line refers to elements of interaction, the bottom line to characterizations of structures. The middle line refers to “modalities” of structure, “the mediation of interaction and structure” in the process of social reproduction.”

According to Giddens, every act draws on all three modalities to some degree: as *interpretive schemes*, to enable or constrain communication and understanding; as *norms*, to enable or constrain action through moral evaluative sanctions; and as *facilities*, to enable or constrain the production or prosecution of action.

The modalities draw on three institutional orders found in historical social systems: the orders of *signification* (language and other code), *domination* (resource allocation and authorization in political economy), and *legitimation* (religion, ethics, law). At the same time interaction draws on these institutions to constitute modalities, it is reconstituting the institutions.

Hence the modalities are the structural site at which the production and reproduction of interacting systems and structural features occurs. Through modalities, structures becomes the *medium* and *outcome* of action. This is what Giddens calls *duality of structure*. Structures are the medium of action because they provide rules and resources people must draw on to interact meaningfully. They are its outcome because rules and resources only exists through being applied and acknowledged in interaction - they have no reality independent of the social practices they constitute.

Structurational conception of a group

We have raised the question earlier on as to whether groups can be said to be able to act, just like individuals do. If the answer to this question were a direct yes without qualification, then the theory of structuration as presented above would be applied to our research without modification.

According to Poole *et al.* (1985), the answer is a qualified yes, arguing that the subject is not a basic unit of action, but rather a produced and reproduced position in a field of structuration. They hold that groups can *act*, and that they can produce and reproduce social structure in the course of acting. They argue that neither our culture nor a considered perspective on the nature of action *requires* that individual persons be the only units capable of acting.

They hold that action at group level takes place in those instances where members find it appropriate and comfortable to use the first person plural (e.g., “We already decided”). They go further to say:

“.....but that choice must be justified theoretically and empirically, as an outcome rather than a presupposition of research”.

This last statement is really at the heart of our research. For one could ask the following question:

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

Our view is that a satisfactory answer with regard to the theoretical justification is located within several philosophical schools of thought, including the meta-theory of structuration itself while the empirical justification should be left to emerge from some applications of

these theoretical groundings. We aim to formulate a framework within which both theoretical and empirical justification could be attainable.

Poole *et al.*'s (*op.cit.*) position that groups can act, that they, rather than actors, can be units of social scientific analysis, has several consequences. One of these consequences is that groups as acting units have a special fragility, because individual members of a group have powers of action. Individuals may act as group members, but they may also act in "self-interest" or even leave the group. The group, like the individual, might be thought of as a "current of signification." One must watch for parallel flows and for cross-currents in the action of both. They then proceed to give a structural definition of a group in terms of action as follows:

Definition: A group is that which acts as a group. Only a group can validate an internal role structure or make a social decision, so when a set of people take, or prepare to take such action, they are a group.

This definition could be said to be an operational definition as it implies that groups can only be seen through action. A decision-making group is one that engages in the action of decision-making. We can only tell if a group is present through its decision but can not tell *what* makes this decision, or in *what form* the group is present.

A structural theory of group decision-making

In presenting their theory-in-progress on group decision-making from a structural perspective, Poole *et al.* (1985) hold that group decision-making can be conceived of as the production and reproduction of *positions* regarding group action, directed towards the convergence of members on a final choice. They focused on three elements of group decision-making in order to track this convergence: members' *expression of preferences* and the negotiation of preference orders; *argumentation* as a means of advancing and

modifying premises and preferred orders; and *strategic tactics* members employ to win assent for their proposals. They call these three elements *message aspects*.

In advancing the above message aspects, all the three modalities of structuration are involved - *language, norms, and power*. Positions are developed through the expression of preferences (*valence*) and through argumentation supplying substantiation for personal leanings. The move towards group convergence is accomplished via the accumulation of verbalized preferences and reasons, and also by the strategies used to manage the accumulation process.

To constitute the three modalities in the group context, the levels of interaction are complemented by three constructs often utilized in traditional group research - *group communication, group decision rules, and power structures*. These “variables” are reconceptualized as structural elements, continually produced and reproduced in group interaction, thereby becoming both the medium and outcome of group decision practices.

As enacted through the three types of messages above (*preferences, argumentation, tactic*), group interaction invokes, constitutes, and reproduces *interpretive schemes* relevant to group decisions; decision rules serves as *normative structures* regulating the accumulation of preferences and reasons and “transforming” them into group decisions; and communication patterns and power structures are *facilities* that (among other things) shape inputs into and enable control over group decisions. The group itself is the basic unit of analysis. The behaviour of individual members does make an important contribution to decision-making, but this contribution is meaningful only in the context of the group interaction system. From this theoretical explanation, the structurational model of group decision-making can be presented diagrammatically as follows:

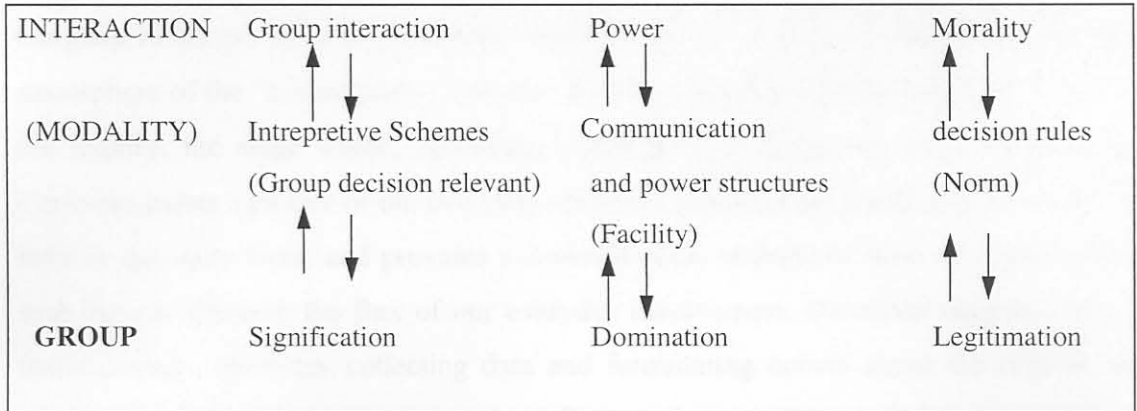


Figure 2.3: A structural model of group decision-making (adapted from Giddens, 1984)

The vocabulary and theoretical structural framework presented here will form a substantial part of our research; both in terms of guiding our research methodology as well as the analysis and synthesis of our research results.

2.4 Philosophical foundations of the concept of justification

The two philosophers who presented coherent arguments on the concept of justification during the seventeenth and twentieth centuries are Descartes and Heidegger. The Cartesian model presented the rational view which *requires and encompasses justification*, while Heidegger challenged this view through his concept of *Dasein* and *Being-in-the world*. What follows is a brief account of their arguments taken from Guignon (1979); which provide us with the necessary philosophical vocabulary for our topic. Because of the relevance of their arguments to our topic, and the appropriateness of these arguments in guiding our research approach, we present their account in some detail.

First, the *Cartesian model*. Philosophical arguments on the concept of justification reached the apex with the rise of the Cartesian world-view in the seventeenth century. Descartes methodically and systematically raised doubts about our everyday beliefs from the standpoint of definite assumptions and with a definite goal in mind (Guignon, 1979).

These assumptions include, first, a picture of our plain epistemic predicament as structured by the “*subject-object*” schema, and, secondly, a conception of *justification* and grounding that is supposed to make our everyday beliefs and practices intelligible. Descartes put three prerequisites for his method of inquiry. The first is that we disengage ourselves from our active involvement in the world in order to achieve the vantage point of an unprejudiced spectator. Descartes has prepared himself for his meditations by always wandering “here and there in the world, trying to be a spectator rather than an actor in all the dramas that are played there” (Guignon, 1979). At the outset of his inquiry he assures himself that “I have delivered my mind from every care and am happily agitated by no passion.”. Only in the refined atmosphere of such a disengaged standpoint, stripped of all its ties to the everyday assumptions that arise from our care and concern, can one achieve the “objectivity” of the contemplative attitude (Descartes, in Guignon, 1979, p.11). The Cartesian inquiry that is conducted within the rarefied atmosphere of the “contemplative attitude” may be divided into three stages. In Stage I of the inquiry, the stage which, according to Guignon, is apparently unproblematic, the Cartesian paints a picture of our everyday epistemic predicament, catalogues the belief we hold in our daily lives, and provides a *common sense* account of how we come to hold such beliefs. Beneath the flux of our everyday involvement, Descartes suggests, we are fundamentally observers collecting data and formulating beliefs about the objects that surrounds us on the basis of this data. The catalogue of our common sense beliefs includes both particular propositions and more general propositions that are supposed to be implied by these particular propositions.

The common sense description of our mundane epistemic predicament also includes a natural account of how we come to have such beliefs. The source of our beliefs about the world is the senses. In our normal affairs, we perceive attributes or marks and features of things and on this basis come to form beliefs. “When looking from a window and saying I see men who pass in the street,” Descartes says, “I really do not see them, but *infer* that what I see is men...And yet what do I see from the window but hats and coats which may

cover automatic machines? Yet I *judge* these to be men.” (Descartes, in Guignon, 1979, p. 13). Our beliefs about the objects we encounter in the world are grounded in certain *plausible inferences* we make from observed marks and features of things to facts about the things themselves.

The Stage I description of our ordinary epistemic situation and beliefs we ordinarily hold is designed to pave the way for Stage II of the inquiry. In this stage, an assessment of the grounds we have for our beliefs is made and found to be inadequate. Since our beliefs are based on the evidence provided by our senses and our senses are not always trustworthy, our beliefs about the external world are not as secure as we would tend to think they are. Descartes notes, for example, that “those towers which from afar appeared to me to be round, more closely observed seemed square... and so on in an infinitude of other cases I found error in judgments founded on the external senses.” According to Guignon (*op.cit.*), Descartes is not content with piecemeal evidence. He devises what might be called a “systematic counter-possibility” that can be applied to any of our beliefs about the world around us. He suggests that in any case in which I think that I am observing something, I might actually be dreaming. Or, alternatively, it is always possible that an evil demon might be deceiving me into thinking that something is the case when it is not. The pressure exerted by such systematic counter-possibilities is devastating to common sense.

“... for if my belief in a proposition, *P*, is based on certain evidence, *E*, and if *E* is always consistent with another proposition that entails the falsity of *P*, then it follows that I do not really know--cannot really be certain about my belief in *P*.” (Guignon, *op. cit.*, p. 13)

This method of arguing in Stage II seems to be in line with our ordinary way of assessing our beliefs in everyday life. Under the pressures of normal practical affairs we sometimes are compelled to accept certain things as true without much consideration of the grounds we have for our assumptions. The demands of daily life force us to be precipitate in our

judgment, and in this respect we may be seen as ordinarily being somewhat rash and negligent. In challenging our ordinary beliefs, it seems that other than being more scrupulous in considering possibilities, it does not appear that the *method* of considering possibilities is anything more than a natural extension of our ordinary techniques of reflection. Guignon goes on to note: for all practical purposes, I can say that I saw Smith last night because I saw someone who looks very much like Smith get out of a car that looks like Smith's car and enter Smith's house. But if something important hangs on my claim, I might have to be more guarded in what I say. If Smith is being tried for murdering his wife and I am called on to testify, I would be inclined to hedge my claims. I might say, "well, it *looked* like Smith in that lighting, but I can't really be sure." There is a mundane way in which we tend to minimize our claims under oath in a court of law. It seems, then, that the Stage II challenge to our everyday beliefs is on the same plane as mundane, common sense investigation. The stringent requirements are already built into our common sense approach to justification.

In Stage III of the Cartesian inquiry, the attempt is made to rebuild our former beliefs on a more secure foundation. What is necessary, the Cartesian suggests, is to find building blocks that will provide a more secure basis for the edifice of our beliefs. This involves at first a *re-description* of our epistemic predicament based on the findings of the second stage of the inquiry. In Stage I we saw ourselves as observers forming beliefs on the basis of perceived marks and features of things. As a result of the reduction of Stage II, however, all we are left with is the certainty of the *ego cogito* and its *cogitationes*. This last stronghold of certainty - the thinking self within its veil of ideas - must provide the foundation for rebuilding our former beliefs. If the structure of our everyday belief is to be made certain and indubitable, then we must find the machinery to convert the incorrigible data found in our consciousness into a full richness of our ordinary view of the world. The Stage III re-description of our epistemic predicament gives us a picture of the self as a kind of container or receptacle in which a collection of ideas are given with absolute

certainty and incontrovertibility. It thus provides us with the self-grounding ground we hoped to find for making our beliefs intrinsically intelligible.

In summary, then, the Cartesian model of inquiry entails *commonsense*, *rational assessment* of beliefs based on this commonsense and the *justification/re-description* of the assessment. The problem with this picture, according to Guignon, is that it is extremely difficult to see how this thinking subject, the *cogito* can transcend the sphere of its own immanence to gain knowledge of objects outside itself. This led to the argument that this project of justification is *in principle* bound to fail. For if the data immediately given to consciousness is subjected to various interpretations (including the dream and evil demon hypothesis), then such data can never be sufficient to guarantee the truth of our common sense interpretation as opposed to alternative interpretations. The “veil of ideas” cannot determine any one interpretation over other possible interpretations.

In challenging the Cartesian model, Heidegger noted that what is at issue is not engaging at arguments and counter-arguments *within* the Cartesian framework of commonsense view of our epistemic predicament, but rather a re-evaluation of the assumptions underlying that framework. Heidegger holds that the “common sense” position that is taken as more or less “self evident” in the first stage of the Cartesian inquiry is not so much a reflection of our everyday attitude as it is the product of a “*breakdown*” in our ordinary involvement in the world. The “common sense” way of rendering the structure of our daily lives is a philosophical “construct” that has originated at a certain point in history and work as a distorting lens on our understanding of ourselves and our world. Since the “common sense” view portrayed in Stage I is a philosophical construct, it embodies from the outset certain philosophical presuppositions that pave the way for Cartesian findings and *prescribe in advance* the plausibility of Stage III re-description of our epistemic predicament. In his *Being and Time*, Heidegger argues convincingly using a phenomenological approach encapsulated in *Dasein* (there-being or being-there) to show that the description of our everydayness leads us to see that our ordinary situations are

better understood in terms of “*Being-in-the-world*” than in the schematism of the subject-object dichotomy. He argues that in the course of our active lives, we are *engaged* in the world in such a way that there is no distinction to be drawn between an isolated subject accumulating data on the one hand, and the collection of items that are to be known on the other. *Dasein*, as “*Being-in-the-world*”, is always “contextualized.” The epistemological “subject” only appears on the scene when our everyday dealings in the world have broken down.

It seems clear, however, that the attack on the subject-object ontology by itself will not satisfy the Cartesian inquirer. For he might maintain that Heidegger has simply *ignored* the problem of justification that is the aim of epistemology in the broad sense. Husserl expressed this feeling of dissatisfaction in the marginal notes to his copy of *Being and Time*. Heidegger would agree that the Cartesian inquiry gains its significance through its analogy with science. His argument is, however, very thorough and compelling.

The fact that Heidegger left *Being and Time* incomplete and that he acknowledged that the techniques and procedures for grounding and justifying within the regional sciences are left in order as they are, suggest that there is merit in probing further into the concept of justification, especially in emerging disciplines such as Information Systems. It is possible that by following closely on these philosophical arguments centred around the concept of justification, new avenues could be found in contributing towards both the theory and practice of decision support systems (DSS) in particular, and Information Systems research in general.

The significance of these philosophical arguments to our study is in two ways. The first is that much of science as we know and practice today, is based on the Cartesian model of rationality, which requires and encompasses the concept of justification. Surprisingly, however, this concept seems to have escaped much of scientific research. The second is that the much referenced Simon’s (1960) model of rational decision-making, which

informs the development of decision support systems and much of the management science literature, also did not pay any attention to the concept of decision justification. The realization of this omission and an attempt to construct a theoretical framework and its rationale, incorporating and integrating the concept of justification would constitute a major contribution of this study to decision theory in general, and in particular, to group decision support systems research and practice.

2.5 The rationality of value choices in information systems development

Arguing along the philosophical grounding presented by Immanuel Kant, Klein and Hirschheim (1996) provide some very fresh thoughts on the scope of information systems development. They follow Kant's classic view of practical reasoning and suggests that the scope of information system development (ISD) practices should not only embrace rules of *skill*, but also rules of *prudence* and rules for *rational discourse* about competing value standards. Their argument is that without warranted value standards (design ideals), the choice among conflicting goals in the development of information systems cannot be based on reason. They examine the dilemma which results from the inevitability of value choices in the practice of information system development (ISD). They present and discuss the principles by which value choices can be approached in a rational way.

They start by emphasizing the importance of rules in peoples' professional lives in general and argue that most of these rules deals with technical rules of skill and not with rules for *determining value choices*.

“In carrying out activities, individuals typically follow a set of rules. Tennis players are taught a set of rules allowing them to hit the tennis ball in a fashion which will cause the ball to cross the net landing in the opponents' court. Students follow rules (some formal, others informal) which allow them to score well in their classes. Information systems developers, either implicitly or explicitly, follow a set of rules which help them to undertake their development tasks. Rules then, we would argue, are ubiquitous. They are,

to a greater or lesser extent, a structured knowledge representational vehicle. They can be used for passing on knowledge on how best to carry out some task, function or activity; or what we ought to do or not do; about what ends are worthwhile and what are the best means for achieving them; and so on". (Klein and Hirschheim, 1996).

Rules of skill are, according to Klein and Hirschheim, concerned with the physical propensity and dexterity to carry out certain operations to achieve specified ends. They are rules which do not question the rationality or goodness of the end towards which they are applied. They are situation dependent and are derived from mathematics and the empirical sciences.

Rules of prudence are concerned with judgments to achieve ends which informed and reasonable people would not question as being worthwhile, such as designing systems which are acceptable to their intended users. They are rules which are said to further the end of happiness.

Categorical rules are concerned with choices where the ends themselves are in question, such as a choice between developing systems which are acceptable to one set of stakeholders (e.g. workers on the shop floor) or another (e.g. a company's shareholders).

Using the *categorical* analogy, Klein and Hirschheim (1996) examine what categorical value choices must be faced in designing information systems, and how these choices may be guided through the exercise of human reason rather than the forces of what they call "blind convention on inertia". By showing some examples of *design ideals* (description of the ultimate good to be achieved through system design) and presenting the argument that information technology is not "neutral", two dilemmas of choices between conflicting design ideals emerged and they presented them as follows:

"Because of the myth of neutrality and the concomitant inevitability of value choices in the design of computer-based information systems, a practical dilemma exists for both the practitioner and researcher. Because he is supposedly acting for the common good of

the organisation, the official view of the systems analyst is that of an impartial change agent who can expect voluntary co-operation. If the neutrality of information systems is a myth, analysts are forced to admit that in their work, they are by definition interest bound. They are more like lawyers or partisan advocates. This analogy suggests that partisanship is not necessarily bad, because without lawyers it would be impossible to adjudicate justice.

In general it is safe to assume that there is a certain amount of conflict between different groups in organisational life, and, as a consequence, analysts are forced to take sides. The disadvantaged parties will realize this and view the system developers' actions with suspicion. At best, they will not volunteer information and at worst they will provide false information in so-called counter-implementation strategies. On the other hand, some analysts might decide to side with user interests and oppose systems which threaten the quality of working life, employment, and the like. A dilemma also exists for the academic researcher. According to the orthodox or "received" view that science should be value free, the scientist must not engage in value judgments in his relationship to the object domain, i.e. the field of inquiry. But if the argument on the neutrality myth is valid, then this received view is in conflict with reality, because, for the reasons indicated, the ideal of a value free scientific method cannot be implemented in the application of ISD. Research into improving such applications is not value free because it is concerned with practical advice for designing "good" systems that will necessarily serve some interests, to a greater or lesser degree, at the expense of others. (Klein and Hirschheim, 1996)".

According to Klein and Hirschheim, these dilemmas can be resolved if the doctrine of an impartial professional practice based on a value free scientific method is abandoned in favour of a much broader concept of science. They quote Radnitsky (1970, p. 1) as having proposed such a broader view: "We conceive of 'science' essentially as a knowledge improving enterprise." Knowledge in this sense is not limited to what can be learned from empirical data collection or mathematical deduction, but includes all human insight and wisdom that can be exposed in moral discourse. In *moral discourse*, the competing value

claims are interpreted, related to each other, and justified. They then present a rational approach.

Contrary to the view perpetuated in the literature that it is not the role of the systems designer to get involved in “politics”, that value choices should be left to other stakeholders (quoting DeMarco, 1978), Klein and Hirschheim believe that system designers *should* be involved in value choices, and, they proceed to show a way of rationally dealing with these value choices.

If practical knowledge about how to approach value conflicts is accepted into the domain of science, it implies a revival of the kind of concerns which Kant discussed under the concept of categorical rules. In contemporary social theory such concerns continue to be investigated. They selected some element of Habermas' (1984) critical social theory (CST) and critical rationalism to identify the conceptual issues that must be addressed if choices among conflicting design ideals are to be justified by human reason rather than by power or appeal to convention.

CST has proposed a number of principles by which the legitimacy of moral value choice can be checked, or as Habermas puts it, the claims underlying such choices can be “redeemed.” These principles relate to the concept of rational discourse. A rational discourse can legitimize the selection of a design ideal because it assures that the arguments of all interested parties are heard, that the choice results in an informed consensus about the design ideal, and the formal value choice is only made by the force of the better argument. Because of the importance of the rational discourse concept, its principles need to be considered in some detail.

According to Klein and Hirschheim, design ideals must be validated by an informed and voluntary (authentic) consensus which has been achieved through a debate which satisfies the conditions of a rational discourse as stated below. The intent of these conditions is to

ensure that all viewpoints and all arguments supporting and contesting each viewpoint have an equal chance to be heard. Basically, a rational discourse is defined by the ideal conditions which should characterize an informed, democratic, public debate. In such a debate no force should influence the outcome except the force of the better argument.

The concept of a rational discourse can be applied to the selection of design ideals at the organisational level. Contrary to the widespread belief that value choices are axiomatic, Klein and Hirschheim argue that they show how logical forms of reasoning can be used to construct arguments supporting and contesting alternative design ideals. It is important that the rational discourse about design ideals arrives at an informed consensus in the relevant community without undue pressures. This provides the prerequisite that the force of the better argument alone decides upon the preferred design ideal or ideals. (There are, of course, barriers to the implementation of the rational discourse concept and these are addressed). If no unique design ideal emerges because of equally strong arguments for more than one design ideal, the tie must be broken by some democratically fair voting mechanism, such as might occur after a parliamentary debate. Quoting Habermas (1973, p. 255 and 256, as quoted), Klein and Hirschheim identify the following four conditions which must be met by a rational discourse: these conditions are also said to define an "ideal speech situation" or a communication community:

- All potential participants in a rational discourse must have an equal opportunity to begin a discourse at any time and to continue it by making speeches and rebuttals, and by questioning and answering. Habermas calls this an equal chance to use communicative speech acts.
- For all participants there must be an equal opportunity to interpret, to assert, to recommend, to explain and to justify as well as to question or to give evidence for or against the validity claim of any of these forms of speech. The purpose of this condition is to assure that in the long run, no presupposition or opinion can escape from becoming the centre of discussion and criticism.

- All participants are presumed to be equally able to express their attitudes, feelings, and intentions. These Habermas calls representative speech acts. They serve as a guarantor against self-deceit, illusions, and insincerity of members among the speech community towards one another.
- All participants are presumed to be equally able to give and refuse orders, to permit and prohibit, to promise or ask for promises, to account and ask for accounting, etc. Habermas refers to these as regulative speech acts. They guarantee that the formal chance of equal distribution of opportunity to begin or continue discourse is realized.

They note that it has been widely recognized that the full realization of these conditions is not possible. However, there are typically two lines of reasoning to address the issue of rational discourse implementation. First, from a practical perspective, it would be sufficient if the implementation of a rational discourse eliminates the worst inequities and assures a reasonable amount of fairness in the arena of communal debate such as might be realized in a well functioning parliament. Second, to deny the practical approximation of a rational discourse is self-defeating, because through the denial one is by definition already engaging in a discourse. As Radnitzky (1973) points out, anyone entering a dialogue in principle presupposes the possibility of a rational discourse. By definition, a signal for dialogue if sincere, entails the willingness to submit oneself to the counterfactual norms of ideal speech, i.e., not to use force, listen to counter-arguments etc. Hence the very attempt to start a dialogue presupposes that a form of communication is possible that is unimpeded by the usual cognitive, emotional and social barriers to rationality, at least to some extent.

“He who enters a discourse implicitly recognizes all possible claims of the members of the communication community which can be justified by reasonable arguments ... and at the same time he commits himself to justify his own claims against others by arguments. In addition, all members of the communication community (and that implicitly means: all

thinking beings)in my opinion are also obliged to consider all virtual claims by all virtual members, i.e., all human 'needs' insofar as they could make claims to fellow human beings." (Klein and Hirschheim, *op. cit.*).

We need to mention, however, that while there are merits to these notion of rational discourse as presented by Habermas, he has been criticized for denying the link between knowledge and power (Giddens, 1984, p.31; Introna, 2000). Introna argues that when value choices are made, not all choices are equal. He goes on to argue as well that not all have equal power to make their preferred choices stick as "true". He describes, following the work of Foucault, how knowledge and power are linked through *regimes of truth*. We will revisit this argument in the next chapter where our research methodology is discussed.

Klein and Hirschheim note that when applying these principles to the justification of design ideals, the rational discourse would have to move through three steps:

- (a) Identification of possible design ideals
- (b) Improvement of the information available to all participants in a discourse through critical reconstruction and analysis of the implications of the alternative design ideals, which relates to overcoming motivational and organisational barriers to inquiry, and,
- (c) Construction of arguments to form preferences in favour of the design ideal which can marshall the strongest evidence on its behalf. Such evidence might consist in evaluating its congruence with respect to values and democratic ideals accepted at the level of society.

If these steps do not converge on one design ideal, then an additional step is needed to legitimize the final selection of one design ideal through some form of voting. They go on

to point out the following barriers to rational discourse in expanding primarily on points b. and c: In implementing a rational discourse, two key issues must be addressed: (1) the barriers to rationality which exist in the current practice of organisational decision-making, and (2) the nature and principles of arguments by which one can reason about competing moral claims. If conventional logic is limited to deductive reasoning with factual premises and causal laws (as orthodox science suggests), then there is great difficulty in reasoning about moral claims.

“However, we hope to show that logical principles exist, which allow checking the plausibility of value claims in a fashion similar to the reasoning rules in propositional and predicate calculus. These principles have a similar axiomatic status as the deduction rules in propositional and predicate calculus.” (Klein and Hirschheim, *op. cit.*)

We are encouraged by the claim that the type of reasoning presented by Klein and Hirschheim is of the same status as the deductive rules of propositional and predicate calculus, because, then their proposed model of argument could lay a solid foundation for a group decision justification process. Their model is based on the work of Toulmin *et al.* (1979) and uses what is called a “*schema of reasoning*”, or the *logical structure of argument*. The Schema/ Structure which we use later in the construction of our analysis framework is shown in Figure 2.4. It is briefly explained as follows:

“ Given grounds, G, we may appeal to warrant, W (which rests on backing B), to justify the claim that C - or at any rate, the presumption (M) that C - in the absence of some specific rebuttal or disqualification (R).”

2.6 Distributed Cognition Process

A decision can *partly* be justified by precisely describing the *process* followed in arriving at it as well as how the *information was structured and communicated*. In essence,

individual judgement based decisions need no justification as it is mainly based on feeling and intuition. In a group setting (non-normative group) however justification may be necessary if an individual hopes to have any influence on the group decision. In other words, the individual cognition has to be distributed through communication. Understanding the distributed cognition process could therefore form a basis of decision justification in a group setting.

Boland *et al.* (1992) define distributed cognition as a process whereby individuals make interpretations of their own situation and exchange them with others with whom they have interdependencies so that each may act with an understanding of their situation and their interdependencies. It is the process whereby individuals construct and reconstruct a system of roles through interpretation, action and self reflection. In our view, acting with understanding, construction and reconstruction of a system of roles through interpretation, action and self reflection forms part of the decision justification process. Construction and reconstruction of a system of roles can be associated with the *process*, interpretation and self reflection can be associated with *information structure*, exchange of interpretations can be associated with *communication* and acting with understanding can be associated with the *decision itself*. We will use this analogy in further enhancing the construction of our analysis framework of group decision justification.

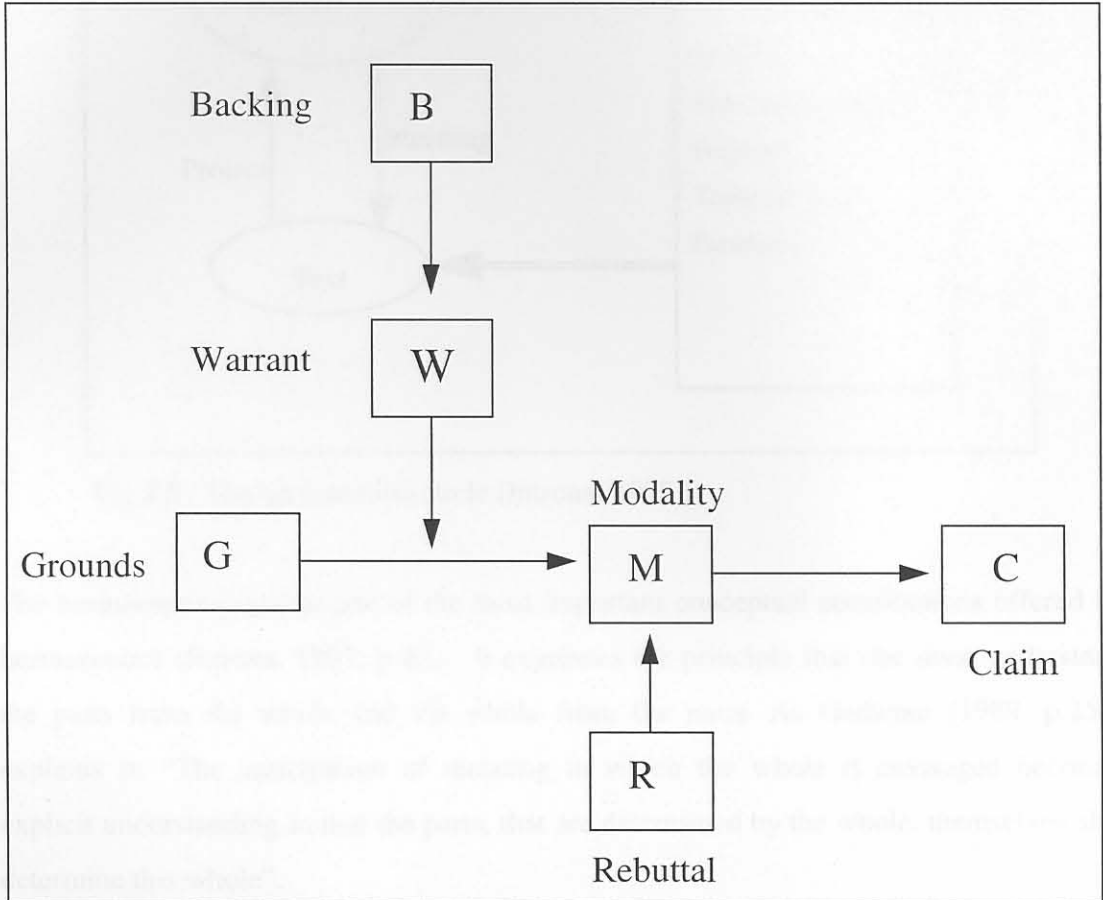


Figure 2.4: Logical structure of argument (Toulmin *et al.*, 1979, p. 78)

Of particular interest to our study is the fact that distributed cognition is a social activity that takes place through *dialogue*, in a similar way that a decision-making group does. When it works well, individual actions take each other into account in a way that yields a co-ordinated outcome (Boland *et al.*, 1992).

2.7 Hermeneutics and the hermeneutic circle

We have already pointed out the relationship between decision justification, information processing (section 2.1) and information structure (section 2.7). In order to describe the *structure* of the information in question, it is imperative that we understand the concept *information*. Intraña (1997), using the work of Heidegger (1962), Gadamer (1989),

Wittgenstein (1956) and Boland (1983), has extensively explored the concept. He concludes that information has to do with the concepts of meaning, understanding and interpretation. He points out that philosophical hermeneutics as developed by Gadamer (1989), provides a frame for gaining insight into the nature of information. It follows, according to Introna (*op.cit.*), that information is hermeneutic understanding, which according to the hermeneutic circle, is always *projected* (see Figure 2.5). Simply stated, hermeneutics is a theory of interpretation and understanding (Introna, 1997, p 55).

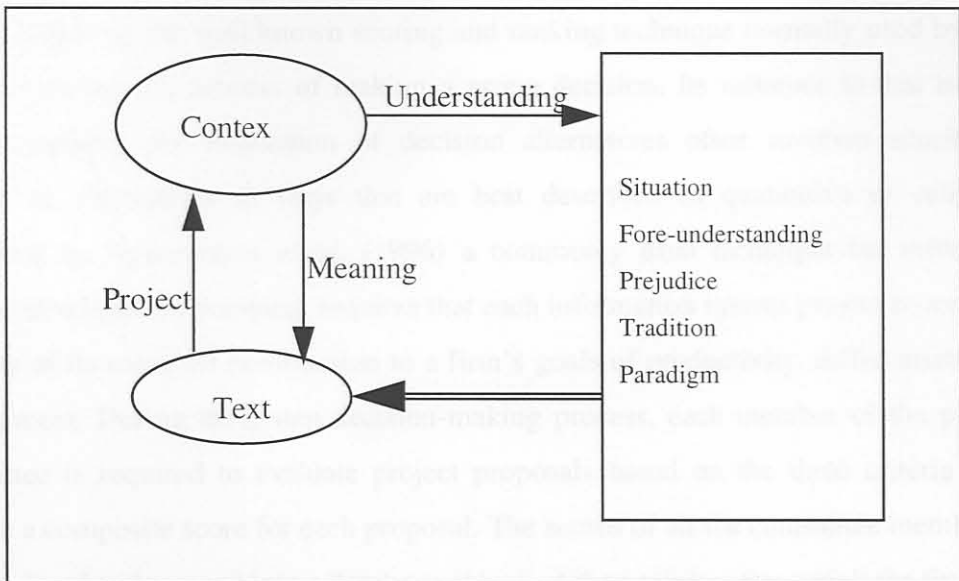


Fig 2.5 : The hermeneutic circle (Introna ,1992)

The hermeneutic circle is one of the most important conceptual contributions offered by hermeneutics (Introna, 1997; p 65). It expresses the principle that one must understand the parts from the whole and the whole from the parts. As Gadamer (1989, p.259) explains it: “The anticipation of meaning in which the whole is envisaged becomes explicit understanding in that the parts, that are determined by the whole, themselves also determine this whole”.

The circle works as follows:

We *project* significance onto the text, based on the form of life within which we interpret; we then allow the text to inform the tradition, which is the living context from which we seek to understand. In the hermeneutic circle, we continually adjust our point of view, perspective or horizon, always within our tradition and situation, in an effort to fuse these points of view, perspectives or horizons. We do this in order to achieve understanding and in order to maintain a living and current form of life.

The hermeneutic way of structuring and processing information could be a helpful way of sharing understanding and meaning by a group during its decision-making process. The shared understanding and meaning could form a significant part of the justification process.

2.8 The Qualitative Discriminant Process

Ngwenyama *et al.* (1996) developed an interesting way of supporting group decision-making. They call it the Qualitative Discriminant Process (QDP). It is a quasi-rational process, allowing the well known scoring and ranking technique normally used by group members during the process of making a group decision. Its rationale is that in group decision-making, the evaluation of decision alternatives often involves scoring and ranking of alternatives in ways that are best described as qualitative or subjective. According to Ngwenyama *et al.* (1996) a commonly used technique for information systems development planning, requires that each information system project be evaluated in terms of its expected contribution to a firm's goals of productivity, differentiation and management. During the group decision-making process, each member of the planning committee is required to evaluate project proposals based on the three criteria and to provide a composite score for each proposal. The scores of all the committee members are then analysed and merged into a "group ranking" of the projects after which the final

decision is made. The goal of deriving a composite score for each proposal necessitates the assignment of a numeric score for each criteria, even though some criteria, such as differentiation, have an obvious qualitative/subjective domain. Worse in a group context is the fact that an acceptable “group ranking” is the objective. It is thus necessary that the committee is able to define a “consensus” measure, identify when a satisfactory level of “consensus” has been achieved and to compute a “group” score for each project proposal.

In continuing the rationale for developing the QDP, Ngwenyama *et al.* (1996) argue that many scoring and ranking techniques commonly used in Group Support Systems (GSS) platforms have been criticized in the decision theory literature for their limitations in dealing with the real difficulties of group decision-making, namely:

- Mapping of qualitative evaluations to point estimates in ranking (Goddard,1983; Weber,1987; in Ngwenyama *et al.* (1996))
- The aggregation of individual preferences into a group preference (Kirkwood & Sarin,1985; Dire & Sarin, 1979; in Ngwenyama *et al.* (1996))
- The analysis and use of point estimate data in facilitating group consensus formation (Dutta,1980; Bropan *et al.*, 1992; in Ngwenyama *et al.* (1996)).

Although many relevant advances have been made in voting, fuzzy set, and possibility theories, they have not significantly influenced current GSS development, (Ngwenyama *et al.* (1996)). In their study, Ngwenyama *et al.* proposed a conceptual framework for scoring and ranking that involves a multistage qualitative discriminant process. The framework is informed by voting, fuzzy set and possibility theories. It provides techniques that are better suited to facilitating consensus formation in group activities than currently exist in most GSSs. It offers the following advantages:

- A clear and simple structured graphical approach to collecting data from users
- Maps qualitative evaluations to numeric estimates
- Allow for vagueness in preference articulation
- Provides support for analyzing data relevant to evaluating consensus formation
- Ease of implementation in manual and computer supported group activities

Like distributed cognition, the qualitative discriminant process provides another classic example of a group decision support process which could easily inform the decision justification process. The difference in the approaches is that distributed cognition is an interpretive process while qualitative discriminant process is a quantitatively informed quasi-rational process. Although our analysis framework is expected to be of an interpretive nature, ideas from both approaches and several other interpretive approaches could easily be borrowed.

2.9 Problem Structuring Methods and Community Operations Research

A fascinating area which also inform this study is a group of frameworks and approaches which are aimed at supporting groups involved in socio-economic development in making decisions. Such frameworks and approaches have been developed and used largely in the United Kingdom and are either collectively classified as issue/problem structuring methods (PSM) or Community Operations Research (COR). For these approaches, *participation* (with its many connotations) by the involved groups in the decision process is central. We use participation here as described by White and Taket (1997), to mean an empowering process which enable local people to do their own analysis, to take command, to take confidence and to make their own decisions. As noted by White and Taket, participatory approaches share the same key features: *flexibility*, *continuous information gathering* at the micro-level, *experimentation* and *iterative learning*. The approaches are spreading rapidly among non-governmental organisations, and to some extent even into government organisations. Strategic Choice Approach developed by

Friend and Hickling (1987) has recently been used for the first time in South Africa within a community development context.

One could say that in these approaches, it would appear that participation is both a necessary and sufficient condition for decision justification. Processes and structures are legitimized and justified by the fact that groups have participated. A question which could be raised here is whether a group that has participated in a decision-making process would necessarily be able to justify a decision reached by the group.

2.10 Systems thinking, critical systems thinking and decision-making

A detailed study of the link between systems thinking and decision-making can be found in Daellenbach (1994). According to Daellenbach (1994, p.18), from about 1940 on, a number of researchers from various scientific disciplines started to recognize that all things and events, and the experience of them, are parts of larger wholes. He indicates that this does not deny the importance of the individual elementary parts or events, but that the focus shifts from the parts to the wholes - namely to the systems to which the parts belong. This gave rise to a new way of thinking - systems thinking. This new way of thought, has, according to Daellenbach, immediate consequences for decision-making within a systems context, namely that effective action in terms of the system as a whole can only result from the careful study of the complete system, rather than of individual parts or aspects.

The history of systems thinking and how it links up with information systems as we understand and practice it today can be found in Checkland (1999). Checkland argues that systems thinking offers an important insight into the role of information systems, the sequence from data to information to knowledge. He emphasizes that information systems are not created for their own sake. They serve or support people engaged in what for them is meaningful action. When one system is thought of as serving another, it is a

fundamental principle of systems thinking that in order to think carefully about, and conceptualise the system which provides the support, it is first necessary to define carefully the nature of the system served (Checkland, 1981; Winter et al., 1995). This is necessary because how we see the system served will define what counts as support to it.

Checkland (in Currie and Galliers; 1999) continues to argue that systems thinking, especially “soft” systems thinking, can provide a way of conceptualising the social processes in which, in a particular organisational context, a particular group of people can conceptualise their world and hence the purposeful action they wish to undertake. That provides the basis for ascertaining what informational support is needed by those who undertake that action. According to Checkland, only then does it become appropriate to ask how modern information technology can help to provide that support, and to provide it.

Various researchers in information systems have since followed closely along the lines of systems thinking. Since the development of Soft Systems Methodology (SSM) by Checkland in 1981 (Checkland, 1981), talks about “hard” vs. “soft” systems thinking form part of the daily vocabulary in the discipline.

Dahlbom and Mathiassen (1993) describe the hard systems approach as follows:

“In the hard systems approach we proceed on the assumption that reality is itself an ordered, stable system. Our goal is to find the true representation of the world and from then on our efforts concern the representation rather than the world itself.”

The hard systems approach puts heavy emphasis on the internal structure of systems. It is precise, well defined, and quantitative. It is used in situations where it makes sense to take the systems apart, observe them to find the internal structure, measure them, make models of them, and expect them to behave with a predictable degree of regularity. They are deterministic in that given certain input, one can determine what output will be

delivered. All possible states can also be detected and can be controlled. When using the hard systems thinking to develop systems, the role of the user is very minimal, with consultation done only in the beginning of the process just to obtain the user specifications for the system. The system is then developed according to the given (or rather self-obtained) specifications, and the developers see the user again during implementation of the system. The user is almost totally excluded from the development life cycle. Most decision support systems have been developed using hard systems thinking.

As we have already noted from Checkland's work above, soft systems thinking on the other hand moves from the premise that our world is shaped by our experience of it. We see different things, have different perspectives, and structure the world differently, depending on interests, background, education, and culture. The world we perceive is the world we live in. Our world will change if our perception of it changes, if we develop a new way of looking at it. A system is based on assumptions about the world. Different assumptions give different systems. As a consequence, there are always several perspectives, resulting in different systems, on the same concrete situation. It involves emotions, personal values, attitudes, and shifting expectations. It encompasses a 'personal' rather than a 'technical' attitude. It follows that information systems developed using soft systems thinking involve the system users throughout the development process.

To hard systems thinkers, systems are "out-there", and we build them, change them, and improve them, by engineering. We see them, and believe what we see. To soft systems thinkers, systems are in our minds (mental constructs), "inside-us" (Daellenbach, 1994, p. 22), they are perspectives that we change and improve by being confronted with other perspectives, by getting around in the world and experiencing new things, by learning.

A system is a system inside another, which in turn is a system inside another, etc. All of these systems work together and intertwine to reach or satisfy a specific goal and

objective. This is known as an open system, according to the father of General Systems Theory, Ludwig von Bertalanffy. Outputs from one system will be the inputs of another and will influence that system in one or the other way. The system is also influenced by certain external factors that come from various places. According to Daellenbach (1994), systems defined for decision-making purposes are always open systems, since by definition the decisions or the decision-making rules are inputs into the system.

Because there are many strands of systems thinking in practice, it became necessary to distinguish them from each other. Based on this and the work of Habermas (1971), Flood (1990) pioneered Critical Systems Thinking, which according to him, consolidates innovative systems thinking changes into a new brand of systems sciences (Flood, R.L in Jackson *et al.*, 1991, p.323). The main idea in Critical Systems Thinking is openness and conciliation between people, and their knowledge and methods. This philosophy is called complementarism. According to Flood, complementarism is the proposition of a meta-science that respects human well-being. It is a meta-science that can co-ordinate other sciences in an informed manner. It harnesses the worth of methods and knowledge according to their strengths and weaknesses.

Jackson (1991) traced the evolution of Critical Systems Thinking and found that it has taken on what he calls five commitments which distinguishes it from other types of systems approaches. These are critical awareness, social awareness, complementarism at the level of methodology, complementarism at the level of theory, and human emancipation.

Critical awareness is concerned with two aspects. The first is the understanding of strengths and weaknesses and also the internal theory behind existing methodologies. This is needed to better understand the internal structure of the different methodologies used for system analysis and in turn be able to apply it only to situations where it is best suited. Secondly, it closely examines the values and assumptions that enter into systems

inquiry and systems design. It provides tools that are useful in applying critical awareness such as Ulrich's (1983) critical systems heuristics. This is necessary to ensure that a possible design is critically scrutinised and not accepted as the only 'objective' possibility.

Social awareness recognizes social and organisational issues that guide systems intervention, contemplates the social consequences of our intervention, and calls for a free and open debate on the justification of the proposed approach. It involves the organisational and societal 'climate' which determines the popularity of particular systems approaches at particular times.

Complementarism suggests that various strands of system thinking express various rationalities and theoretical positions. These should be respected and their development should be encouraged. It stands for a commitment to the complementary and informed use of the various systems approaches whenever their use is appropriate to the context of specific social conditions and situations. Complementarism should occur at two levels. At the level of methodology, the 'system of systems methodologies' attempts to reveal what is taken for granted in terms of 'systems' and 'participants' in using a specific type of systems methodology. Potential users of systems methodologies could assess the relative strengths and weaknesses of each approach. At the level of theory, different strands of systems thinking stemming from alternative theoretical positions can be presented. According to Jackson, the claim of any one theoretical rationality, whether functionalist, structuralist, interpretive or emancipatory, to absorb all others, must be resisted. Complementarism guides each systems approach on problem types for which its theoretical rationality is appropriate.

Human emancipation aims to ensure the well-being of all individuals involved and the full development of their potentials, and to prevent coercion and the exercising of power that would prevent open and free discussion of the issues. Here, Jackson (1991) alludes to the fact that in certain cases, a democratic culture does not exist in organisations and

that this in turn inhibits the generation of ideas and the development of personal skills and potential. The use of critical systems thinking tries to prevent this and to encourage the creation of ideas and open discussion of issues.

While Flood and Jackson provide the foundations of critical systems thinking, it is perhaps the work of Midgley (1991) that enhances its relevance to our study. Midgley (1991) explains that being critical about systems expands our understanding of the process of making *boundary judgments* so as to explore the relationship between the boundary judgments, values and ethics. Boundary judgments have to do with accepted knowledge and values. In this sense, accepted knowledge define the values that can emerge, while values adopted will direct the drawing of boundaries that define the knowledge accepted as pertinent. He uses examples to clearly explain what it means to be critical about systems. According to Midgley, being critical about systems means being critical about *defining system boundaries* and about *establishing boundaries within which critique can be conducted*. Boundary judgments have to be made and it is best to embrace critical flexibility with regard to boundary judgments. The notion of *defining, establishing, making, and critiquing boundary judgments* clearly relates to the process of decision-making. We are made aware that creating boundaries simultaneously casts the 'other' into darkness and that every aspect has its 'other' and being aware of the 'other' is an effective remedy for 'hardening of the boundaries' (Midgley, 1991). There is also the possibility of grey areas in which *marginal* elements lie that are neither fully included in, nor excluded from, the system definition. The concept of 'otherness' could be very helpful in group decision-making as it could assist the group to engage in a *true social dialogue* as discussed earlier.

As illustrated by Midgley (1991) (see Figure 2.6), the system consists of an inner core which contains elements which are within the primary boundary. Then there are elements of the wider system which are recognized as being pertinent to the system but are not explicitly taken into the definition of the system's boundaries. These elements can be

described as marginal to the boundaries. These marginal elements lie outside the primary boundary but indicate an alternative system boundary, the secondary boundary. Elements lying between these two boundaries are *marginal* to the system. The boundaries need not be tacitly employed, they could be implied or unconsciously given in an analysis. It should be kept in mind that a wider system exists outside the secondary boundary. This system is not really seen as pertinent to the original system. The primary boundary can be retained and marginal elements can be dealt with in relation to it. Alternatively, the primary boundary can be disbanded, then the secondary boundary will become primary due to wider issues which become more important than those narrowly defined in relation to the system boundary (Midgley, 1991). Figure 2.6 captures Midgley's arguments.

According to Midgley, critical systems thinking will prevent an impoverished systems view due to boundaries which have become fixed through the use of tacit knowledge alone, without the benefit of rationally generated theory. The boundaries of accepted knowledge define the values that can emerge. Similarly, the values adopted will direct the drawing of boundaries that define the knowledge accepted as pertinent. This dynamic relationship between what could be seen as *truth* and *rightness* defines critical systems thinking. He introduces a status of sacred (positive) or profane (negative) on marginal elements by suggesting that the choice between boundaries can involve a choice between different ethical concerns. When primary and secondary boundaries carry different ethical implications, tension is set up. Because ethical issues and associated boundary judgments have roots in culture, cultural reactions can set in when ethical tensions arise.

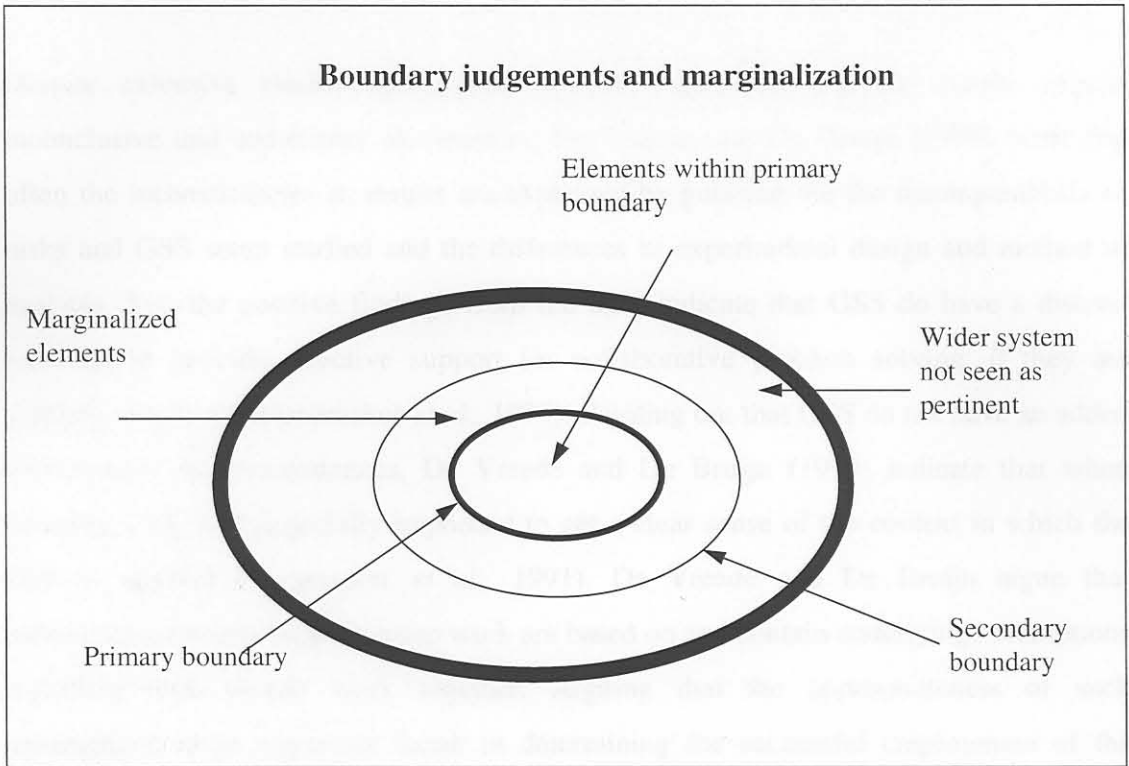


Figure 2.6 : Marginalization. (Midgley in Jackson *et al.*, 1991, p. 398)

These cultural reactions are marginal to boundary definitions and marginal elements come to be characterized as either sacred or profane. Profanity supports the primary boundary by denigrating those elements that are marginal to it. In contrast, sacredness in the margins supports the secondary boundary. In addition to this, ethical tensions give rise to sacredness and profanity and the whole process is overlaid with social ritual. Ritual can be defined as behaviour that contains certain stereotypical elements that involve the symbolic expression of wider social concerns. By observing the presence of ritual, an indication is received as to where sacredness and profanity might lie and hence where ethical conflicts related to marginalization might be found. Midgley warns that life is a dynamic web of boundaries, marginalizations, ethical conflicts and value judgments, and no systems representation can be viewed as an absolute.

As Daellenbach (1994) puts it, most decision-making occurs within a systems framework. Midgley on the other hand argues that ‘critical’ and ‘systems’ are inseparable. It follows that decision-making processes, whether by individuals or groups, would benefit from a better understanding and practice of critical systems thinking. It follows also from Checkland’s work that information systems designed and developed within a systems thinking paradigm would be better able to support turbulent decision-making environments, such as instances when decisions have to be justified.

2.11 Group Support Systems research and use

Despite extensive studies undertaken on GSS and their use, the results remain inconclusive and sometimes inconsistent. De Vreede and De Bruijn (1999) posit that often the inconsistencies in results are explained by pointing out the incomparability of tasks and GSS setup studied and the differences in experimental design and method of analysis. Yet, the positive findings from the field indicate that GSS do have a distinct potential to provide effective support for collaborative problem solving, *if* they are skilfully employed (Nunamaker *et al.*, 1997). Pointing out that GSS do not have an added value under all circumstances, De Vreede and De Bruijn (1999) indicate that when studying GSS, it is especially important to get a clear sense of the context in which the GSS is applied (Nunamaker *et al.*, 1991). De Vreede and De Bruijn argue that technologies used to support group work are based on and contain underlying assumptions regarding how people work together. Arguing that the appropriateness of such assumptions is an important factor in determining the successful employment of the technology, they used an action research approach to explore what they called the boundaries of effective GSS application by challenging the basic assumptions built into GSS. They conclude that GSS should be avoided during the separation phase where winners and losers can be identified. Their findings are consistent with various experimental studies that found that GSS application is more successful for creativity tasks than for preference tasks and mixed motive tasks (De Vreede and De Bruijn, 1999).

A more intriguing kind of research on GSS, the one that seems most relevant to our study, is the one being recently pursued by Briggs *et al.* (2001) using the notion of *thinkLets*. According to Briggs *et al.*, one cause of the conflict and ambiguity in GSS research results may be the result of focusing on what they say is a less-than-useful level of abstraction: GSS itself. They argue that in GSS research, the thinkLet may be a more useful unit of comparison than the GSS. A thinkLet, according to the authors, encapsulates three components of a GSS stimulus: *The tool, its configuration, and the script*. They report on having documented about 60 thinkLets that map to seven basic patterns of thinking: Diverge, Converge, Organize, Elaborate, Abstract, Evaluate, and Build Consensus. Each thinkLet creates some unique variation on its basic pattern.

By focusing research on thinkLets, rather than GSS, they predict that field and laboratory research may be more controllable, more replicable, and better able to inform GSS development and use. They note that their field experience shows that thinkLets may be used to create repeatable, predictable patterns of thinking among people making an effort toward a goal. It is our view that the notion of thinkLets relates closely to Toulmin *et al.*'s schema of reasoning as presented earlier. It seems possible that through the relationship between thinkLets and Toulmin *et al.*'s schema, one could better analyse how GSS could be used to support decision-making groups when justification of such decisions become necessary. This will be further pursued in chapters 4 and 5 when the last two of the primary research questions raised in section 2.1 of our study are addressed.

2.12 A new decision-making paradigm for DSS research

A new decision-making paradigm for DSS has been proposed by Courtney (2001). Because the study of GDSS derives from the original DSS, which to a large extent is modelled along the influential work of Simon (1960), this new paradigm for DSS also suggests a new paradigm for GSS, and in particular GDSS. Simon described the decision-making process as consisting of three phases: intelligence, design and choice. Intelligence

means the need for decision-making activity is identified and the decision-making process is initiated. Design involves the development of alternative ways of solving the problem,

and choice consists of analyzing the alternatives and choosing one for implementation. Based on Simon's model, the first DSS began to appear in the late 1960s and early 1970s (Sprague and Watson, 1986, p.5). Pioneers on DSS research included Gorry and Scott Morton (1971). A mostly used model of the decision-making in a DSS environment is shown in Figure 2.7. Courtney (2001) describes the Figure as follows: the emphasis came to be on model development and problem analysis. Once the problem is recognized, it is defined in terms that facilitate the creation of mathematical models. Alternative solutions are created, and models are then developed to analyse the various alternatives. The choice is then made and implemented as in Simon's description.

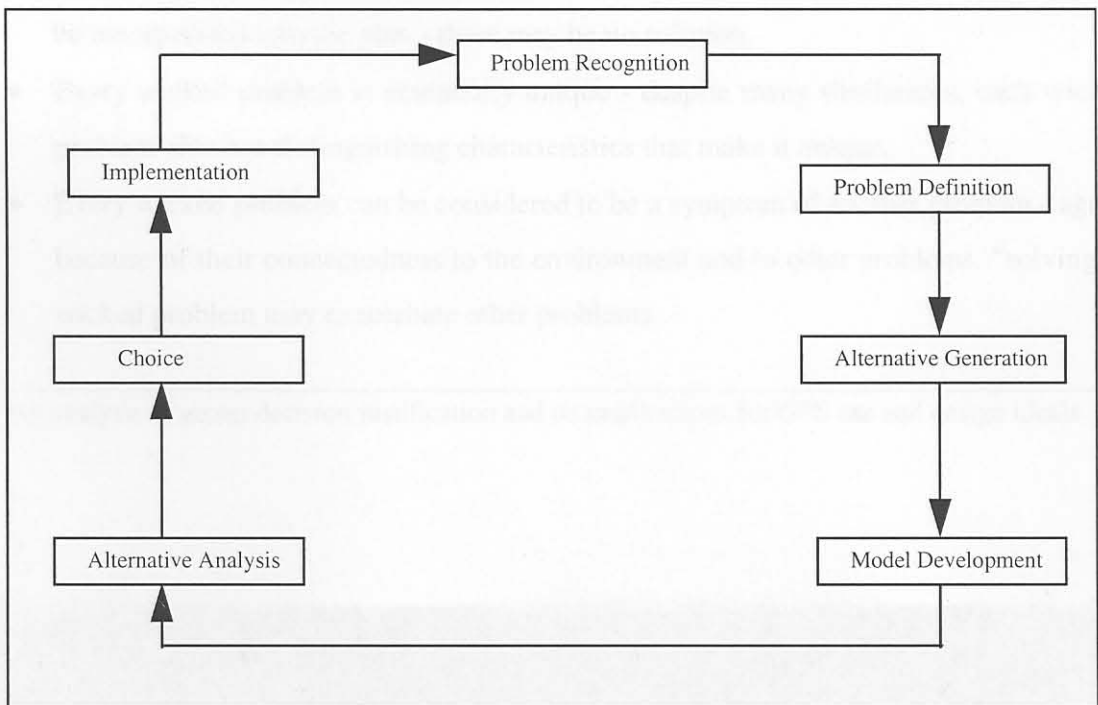


Figure 2.7: The conventional DSS decision-making process (Courtney, 2001)

He indicates that in ill-structured situations, no decision process is this clear-cut. Phases overlap and blend together, and there will be recycling to earlier stages, as more is learned

about the problem, as solutions do not work out and so forth. In proposing the new paradigm for decision-making, Courtney starts by using the work of Rittel and Webber (1973) to describe DSS decision environments of the 21st century as “wicked”. To such “wicked” problems, the classical rational paradigm of science and engineering are not applicable as such problems belong to the open social systems.

According to Courtney, 10 properties of wicked problems are listed by Rittel and Webber:

- There is no definitive formulation of wicked problems - formulating the problem *is* the problem.
- Wicked problems have no stopping rule - planners stop, not because they have “the” answer, but because they are out of time, money, patience or because the answer is “good enough”
- Solutions to wicked problems are not true or false, but good or bad - values are inherently a large part of the problem and values employed vary among stakeholders.
- There is no immediate or ultimate test of a solution to a wicked problem - solutions to wicked problems, because they are so inextricably bound to their environments, generate “waves of consequences over extended - virtually unbound - period of time.”
- Every solution to a wicked problem is a “one-shot operation”; because there is no opportunity to learn by trial and error, every attempt counts significantly - and consequently, solutions cannot be undone.
- Wicked problems do not have a numerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan - there may be *no* solution.
- Every wicked problem is essentially unique - despite many similarities, each wicked problem also has distinguishing characteristics that make it unique.
- Every wicked problem can be considered to be a symptom of another problem - again, because of their connectedness to the environment and to other problems, “solving” a wicked problem may exacerbate other problems.

- The existence of discrepancy [between actual and desired states of affair] can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution - the choice is the one most plausible to the decision maker.
- The planner has no right to be wrong - scientists may formulate hypotheses that are later refuted, but planners seek to improve some aspect of the world. "*The planner who works with open systems is caught up in the ambiguity of their causal webs.*"

Noting that globalization will lead to more wicked problems, Courtney laments that methods are desperately needed to help with making effective decisions in such situations. He indicates that while models and knowledge-based DSS exist, more powerful tools are required and points out that especially GSS can help with such problems. He calls for a broader perspective in terms of DSS research. Courtney does not stop at lamenting. Using the work of Churchman (1971), Mitroff and Linstone (1993), he discusses DSS and knowledge management in Singerian organisations and sets the stage for a new decision-making paradigms for DSS. A new decision style as exhibited by Singerian organisations and Unbounded Systems Thinking (UST) of Mitroff and Linstone is proposed by Courtney. Churchman's work on "the design of inquiring systems" is based on the work of five influential western philosophers, Leibniz, Locke, Kant, Hegel and Singer. A summary of the "inquiring organisations" derived by Courtney from this work can be seen in Table 2.1.

Courtney starts by considering the nature of knowledge and knowledge management and its relationship to decision-making in organisations. He presents Churchman's (1971) view of knowledge - knowledge as a collection, an activity or a potential. When viewed as an activity, "Knowledge is a vital force, which makes an enormous difference in the world" (Churchman, 1971, p. 10). It implies that the ability to act is pragmatic in the sense that it implies that someone knows how to do something correctly. Yet, a person does not have knowledge only when acting. A database analyst knows how to normalize a databases even when she is asleep. Thus knowledge can be viewed as the potential for

action. Yet, “To be knowledgeable, one must be able to adjust behaviour to changing circumstances”(Churchman, 1971, p. 11). Thus being knowledgeable implies not only how to perform an act correctly, but also how to learn as circumstances change, which according to Courtney (2001) is an essential ability in today’s dynamic environments. He continues to discuss other forms of knowledge and knowledge management aspects for which we refer an interested reader to Courtney (*op. cit.*).

Of particular relevance to our study is Courtney’s discussion of the interpretive perspective of knowledge creation, which is founded on the belief that social reality is socially constructed, and attention is directed to interpretation, distributed cognition, communication, and social processes. Knowing and knowledge are inseparable from action, as in the Churchmanian view described above. Courtney describes knowledge both as action and object - that is as both procedural and declarative. Organisational knowledge is viewed as existing in a “collective mind,” developed through interpretation, communication, and shared meanings. Organisational knowledge is in a constant state of flux as new experiences are evaluated and shared. According to Courtney (*op. cit.*), knowledge management in this environment consists of fostering communication between individuals, sharing and enriching interpretations, and co-ordinating actions. Courtney posits that a collective culture must be created in such organisations to permit effective communication and sharing of knowledge. Such a culture in the context of this study is equivalent to what we have earlier described as the *decision justification social practice*. Such a culture need cannot just develop, but needs to be collectively created and practised.

Courtney proceeds from this knowledge management perspectives and presents a notion of inquiring organisations, which he defines as learning organisations patterned after Churchman’s (1971) inquiring systems. He presents what he calls the five flavours of inquiring organisations: Leibnizian, Lockean, Kantian, Hegelian, and Singerian, each based on the philosophies of their respective namesakes. According to Courtney, the

organizations may be entire enterprises, or possibly even social systems, but more likely would be units within an enterprise. They could also be temporary groups or teams established to resolve a decision problem. Following Mitroff and Linstone (1993), who called the decision styles of Leibnizian and Lockean as “old style”, Kantian and Hegelian as “complex thinking” and arguing for the need of a “new thinking” as exhibited by Singerian organisations, Courtney uses their Unbounded Systems Thinking (UST) to propose a new decision-making paradigm for DSS. This new decision-making paradigm can be seen pictorially in Figure 2.8. The new paradigm derives from the “five flavours” of Churchman (1971) and Mintroff and Linstone’s (*op cit.*) Unbounded Systems Thinking (UST). A brief description of each type of organisation and its decision-making and knowledge management styles is given next, followed by the UST and finally the new decision-making paradigm for DSS proposed by Courtney.

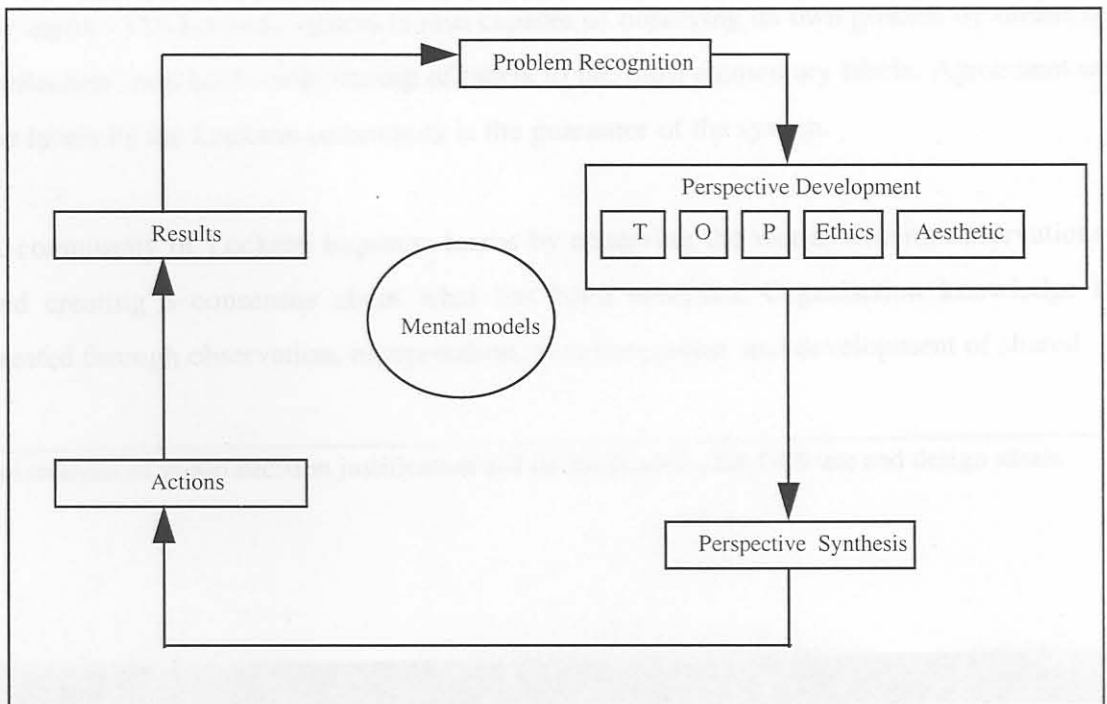


Figure 2.8: A new decision-making paradigm for DSS (Courtney, 2001)

The Leibnizian Organisation

A Leibnizian inquiring system is a closed system with a set of built-in elementary axioms that are used along with formal logic to generate more general fact nets or tautologies. The fact nets are created by identifying hypotheses, each new hypothesis being tested to ensure that it could be derived from, and is consistent with, the basic axioms. Once so verified, the hypothesis becomes a new fact within the system. The guarantor of the system is the internal consistency and comprehensiveness of the generated facts.

The Leibnizian organisation creates knowledge by using formal logic and mathematical analysis to make inferences about cause and effect relationships. Decision-making procedures in Leibnizian organisations exhibits a strict, formal bureaucratic, “by the book” approach. Mitroff and Linstone (1993) call this the analytic-deductive approach to decision-making, an approach which is only suited to well structured, simple problems; but entirely unsuited to the unstructured domains found in DSS arena (Courtney, 2001).

The Lockean Organisation

Mitroff and Linstone (1993) refer to Lockean inquiring systems as being inductive and consensual. Empirical information, gathered from external observations, is used inductively to build a representation of the world. Elementary observations form the input to the Lockean inquirer which has a basic set of labels (or properties) which it assigns to the inputs. The Lockean system is also capable of observing its own process by means of “reflection” and backwards tracing of labels to the most elementary labels. Agreement on the labels by the Lockean community is the guarantor of the system.

A community of Lockean inquirers learns by observing the world, sharing observations, and creating a consensus about what has been observed. Organisation knowledge is created through observation, interpretation, communication, and development of shared

meanings. The organisation's culture or subculture (a Lockean community) must be supportive of this kind of environment. The decision style is group-oriented and open. The primary knowledge management tools in Locken organisations are repositories, such as datawarehouses, for storing observations, datamining for analyzing observations, and groupware tools, such as electronic meeting software and e-mail, for facilitating the communication process, and the development of shared meaning (Courtney, 2001).

The Kantian organisation

The Kantian system is a mixture of the Leibnitzian and Lockian approaches in the sense that it contains both theoretical and empirical components. The empirical component is capable of receiving inputs, so the system is open. It generates hypotheses on the basis of inputs received. A clock and kinematic system are used to record the time and space of inputs received. The theoretical component allows an input to be subjected to different interpretations. This occurs because the Kantian theoretical component maintains alternative models of the world (alternative world views). Representations and interpretations are based on causal connections maintained in the models. The theoretical component contains a model building constituent, which constructs Leibnizian fact nets. It tests the alternatives by determining the best "fit" for the data, and the guarantor in this approach is the degree of model/data agreement. The use of alternative models permits, for example, one piece of economic data to be interpreted differently by different econometric models (e.g., competing models proposed by different political parties). Additionally, an "executive routine" turns the Kantian models on and off and can examine their outputs in terms of the degree of satisfaction with their interpretations. Thus, if a model is not producing satisfactory results it can be turned off, while those which are more successful proceed.

According to Courtney, the decision style of the Kantian organisation is to encourage the development of multiple interpretations of a set of data. It is both empirical and

theoretical in its approach. Courtney (2001) notes that the perspectives tend to be very analytically based, however somewhat akin to combining the Lockean and Leibnizian approaches, but relying heavily on analytical methods for interpreting the data. Mitroff and Linstone (1993) believe this approach is suitable for problems of moderate complexity. The knowledge management system of the Kantian approach, is according to Courtney, closest to that of the functional view. It is based on the belief that problems can be modelled analytically. There is little or no emphasis placed on human interpretation of the problem, nor of human involvement. The problems is attacked strictly from a technical perspective. Courtney says that this approach requires knowledge management software capable of maintaining data about the problem and supporting the development of alternative types of models that attempt to explain the data.

The Hegelian organisation

Hegelian systems function on the premise that greater enlightenment results from the conflict of ideas. The Hegelian dialectic is comprised of three major players. The first player begins the dialectic with a strong conviction about a fundamental thesis. This player or subject, besides holding a strong belief in the thesis, constructs a view of the world in such a way that information, when interpreted through this world view, maximizes support for the thesis. The second player is an observer of the first subject. The observer generates an opposing conviction to the original thesis. In fact, the observer is "passionately dedicated to destruction of the first subject's conviction" (Churchman, 1971, p. 173). The final player in the Hegelian dialectic is a "bigger" mind and an opposition to the conflict between the thesis and the antithesis. This "bigger" mind synthesizes a new (larger) view of the world which absorbs the thesis/antithesis conflict. Synthesis generated by the objective "bigger" mind acts as guarantor of the system. Objectivity is based on a kind of interconnection of observers (Churchman, 1971, p. 149). They promise that "the movement from thesis-antithesis to synthesis is a soaring to greater heights, to self-awareness, more completeness, betterment, progress" (Churchman, 1971, p. 186).

The decision style of the Hegelian organisation is based on conflict. Decision makers encourage the development of opposing viewpoints on how to resolve a decision problem. Debate between parties holding the opposing views is encouraged. The decision is forged from the two views in such a way that the problem is not only solved, but also completely dissolved. Courtney notes that Mitroff and Linstone (1993) have found this to be an effective approach to surfacing assumptions in strategic planning problems, leading to more effective plans. The knowledge to be managed in this environment consists of the information that the thesis and antithesis attempt to interpret, the thesis and antithesis themselves, the debate and the synthesis. Courtney sees Groupware designed to support negotiation and arbitration as well suited for this approach, along with repositories holding the data being debated, document management software, and analysis tools for developing points to support either the thesis or antithesis.

The Singerian Organisation

Two basic premises guide Singerian inquiry (Churchman, 1971, pp. 189-191). The first premise establishes a system of measures that specify steps to be followed in resolving disagreements among members of a community. Measures can be transformed and compared where appropriate. The measure of performance is the degree to which differences among group members' opinions can be resolved by the measuring system. A key feature of the measuring system is its ability to replicate its results to ensure consistency.

Table 2.1: Summary of inquiring systems characteristics (Courtney, 2001)

	Leibniz	Locke	Kant	Hegel	Singer
Decision-making style	Formal Analytical Bureaucratic	Open Communicative Consensual	Open Analytical Multi-model	Conflictual	Teleological Cooperative Ethical
Knowledge perspective/ mode	Functional Combination	Interpretive Socialization	Functional Combination	Critical Socialization- Externalization	Interpretive- Critical Socialization- Externalization
Knowledge creation process	Induction Mathematical analysis Formal Logic	Deduction Observation Classification Communication	Mathematical analysis Multiple models Choose best	Construct theses, antitheses Dialectic Synthesis	Strategy of disagreement Sweeping-in Multiple perspectives
Information technology	Math models DSS Expert systems Document management	Repositories Groupware Networks	Databases Model management systems	Repositories Negotiation systems	Groupware Networks Repositories Document management

The second principle guiding Singerian inquiry is the strategy of agreement (Churchman, 1979, p. 199). Disagreement may occur for various reasons, including the different training and background of observers and inadequate explanatory models. When models fail to explain a phenomenon, new variables and laws are "swept in" to provide guidance and overcome inconsistencies. Yet, disagreement is encouraged in Singerian inquiry. It is through disagreement that world views come to be improved. Complacency is avoided by continuously challenging system knowledge. Singerian inquiry provides the capability to choose among a system of measures to create insight and build knowledge. A simplistic optimism drives the community toward continuous improvement of measures. However,

An analysis of group decision justification and its implications for GSS use and design ideals

the generation of knowledge can move the community away from reality and towards its own form of illusion if not carefully monitored.

Courtney indicates that it is difficult to discuss the Singerian organisation separately from Mitroff and Linstones' (1993) *Unbounded Systems Thinking (UST)* as they are closely related. His new decision-making paradigm is based on both. At the core of the UST is, according to Courtney, the development of multiple perspectives, a critical aspect of which is open, honest and effective dialogue among all relevant stakeholders in the problem involved. From the literature already alluded to in this chapter, it seems to us that Courtney's new decision-making paradigm for DSS could inform the theoretical framework of our study, the finer details of which are discussed in chapter 4. Figure 2.8 shows only a schematic representation of the new decision-making paradigm for DSS.

2.13 Conclusions from the literature review

We mentioned in the introduction that we are interested in 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. We raised four primary research questions in section 2.1 and pointed out that in addition to this enhanced understanding, we are also interested in finding out what its implications are with respect to the use and design ideals of group decision support systems. This establishes the *purpose* of the research.

The literature reveals to us that although the concept of justification has been noted since the beginning of modern science, as demonstrated by the Cartesian inquirer, it has either been ignored or assumed. Other than Descartes' philosophical arguments on the concept, we have found only five instances where the concept and its potential benefits were explored (De Hoog & Van der Wittenboer, 1985; Hagafors & Brehmer, 1983; Bacharach, Bamberger and Mundell, 1995; Toulmin, Rieke and Janik, 1979, and Ulrich, 1987. In the case of Toulmin *et al.*, we have seen that the need for justification has to be established

first, while Giddens' (1984) structuration theory simply assumes it. We have also noted that the much referenced Simon's (1960) model of rational decision-making, which informs the development of decision support systems and much of the management science literature, also did not pay any attention to the concept of decision justification. We find this surprising as much of science as we know and practice it today, is based on the Cartesian model of rationality, which requires and encompasses the concept of justification. We take the position well articulated by Bacharach *et al.* (1995) that underlying every human decision-making is the anticipation of post-decision anxiety and the decision maker's consequent need to reduce it. It follows from this that the need for decision justification cannot be socio-psychologically optional and that until we understand the underlying logics of decision justification, the "black box" in decision theory is likely to remain quite large.

Moving from this position, the literature presents us with two opportunities. The first is the recent work by Courtney (2001) on a new decision-making paradigm for DSS. This new paradigm would enable us to incorporate and integrate the concept of decision justification into a solid theoretical framework of mainstream decision theory. This would enable us to address the first two of our primary research questions. The second opportunity is that presented by Briggs *et al.* (2001) on thinkLets. It is our view that the notion of thinkLets relates closely to Toulmin's schema of reasoning as presented earlier. It seems possible that through the relationship between thinkLets and Toulmin *et al.*'s schema, one could better analyse how GSS could be designed and used to support decision-making groups when justification of such decisions become necessary. This will enable us to address the last two of the primary research questions.

We see Toulmin *et al.*'s schema of reasoning as the potential link between the two sets of research questions, through systems thinking, structuration theory, the UST and thinkLets. The rest of the literature cited here will assist us in responding to secondary questions to be raised in the next and subsequent chapters.

The literature is also indicative of possible research methodologies which could be pursued in a study of this nature. We explore such methodologies and their rationale and arrive at a choice of our research method in the next chapter.

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:

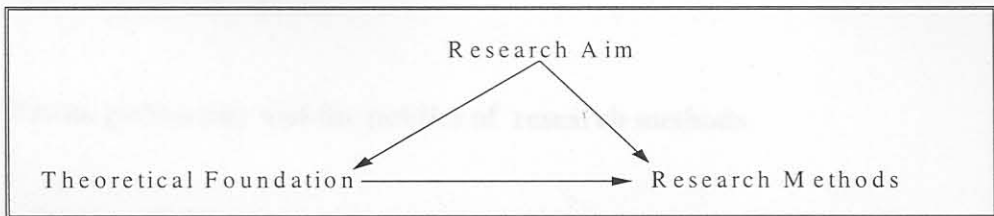


Figure 3.1: Triad for the justification of research (Petkova, 1999; adapted from Banville and Landry, 1992; Robey, 1996)

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 complementarity 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:

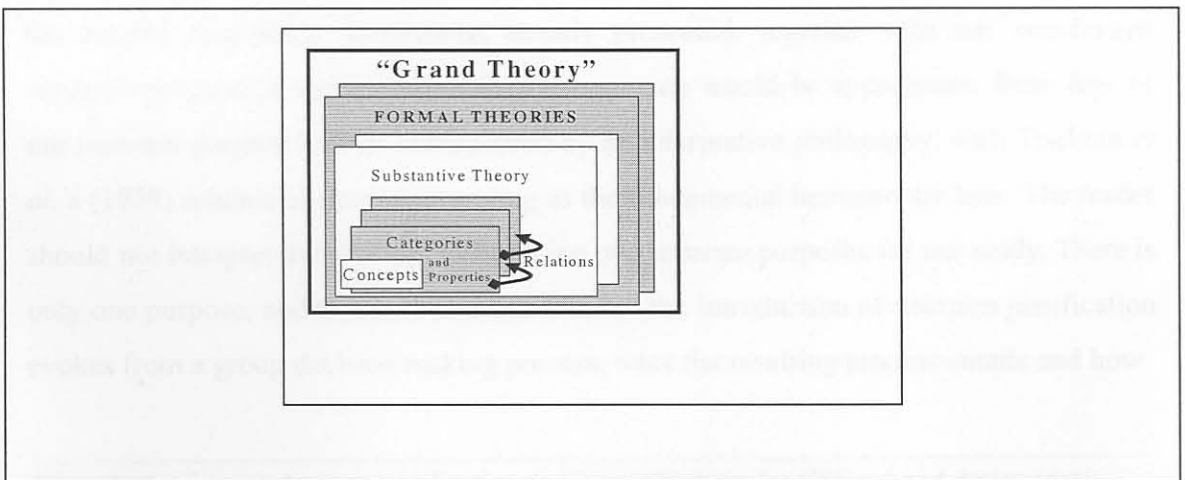


Figure 3.2: Taxonomy of Grounded Theory research elements. Source: Lehmann(1999)

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.

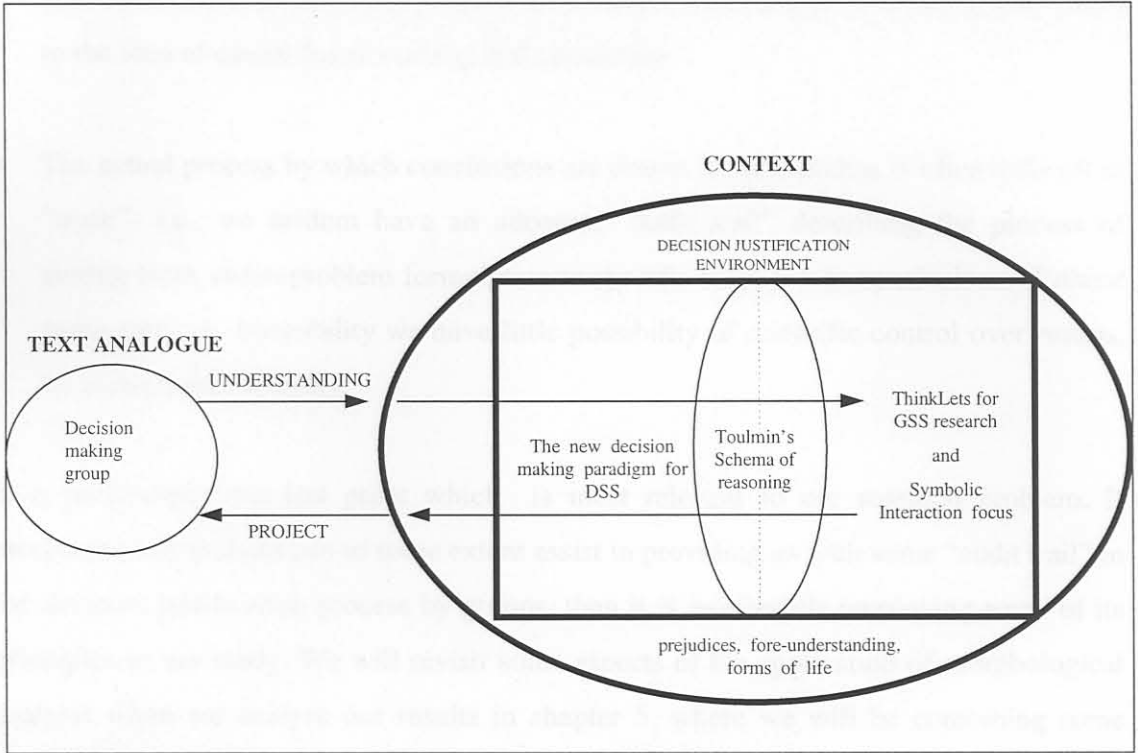


Figure 3.3: The systemic-interpretive-hermeneutic research framework

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.

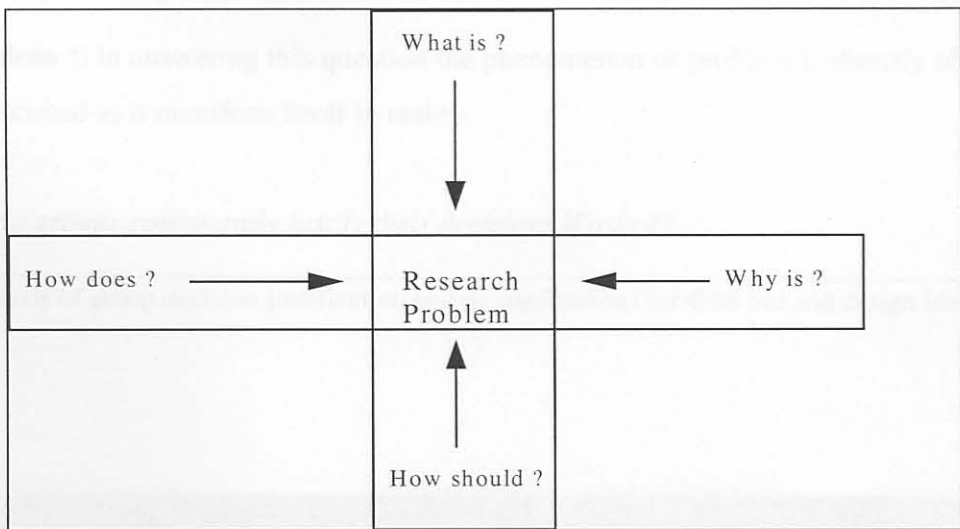


Figure 3.4: Research questions space (Roode, 1993, p. 11)

(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.

Chapter 4

The Research Framework and its Theoretical Grounding

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Chapter 4

Dick Boland will tell you that in order to understand my choice you need to understand my vision of the world - my fears, biases, distortions and questions. Unfortunately, I am not clear on how I see the world. I am somewhat attracted by theories of chaos and my focus today is therefore more likely to be random than logically selected. However, like a competent researcher I have tried to make chaos look like order by producing a framework to guide my remarks.

Enid Mumford

The Research Framework and its Theoretical Grounding

4.0 Introduction

In this chapter, we present the details of the research framework we have constructed in order to guide the rest of this research. When we first presented this framework in chapter 3 (shown in Figure 4.1, previously labeled Figure 3.3), we stated explicitly that it emerged from the literature we have presented thus far, coupled with our own fore-understanding, interests and prejudices consistent with the hermeneutic tradition. Although the theories employed in the framework could be said to be stable, their use in the framework is not stable. It is only our construct to enable us to analyze the data we have already collected as well as that which we still have to collect. It is therefore a construct to inform as well as to be informed by empirical evidence. It is not an “out-there” representation of the world, but rather an “inside-us” construct, in Daellenbach’s (1994) systems thinking language.

The framework is decomposed into five pairs of lenses which are used as interpretive schemes embedded within a hermeneutic frame. Although these schemes are based on using existing theories rather than on the application of specific research methods, the pair-wise approach is informed by the work of Visala (1991).

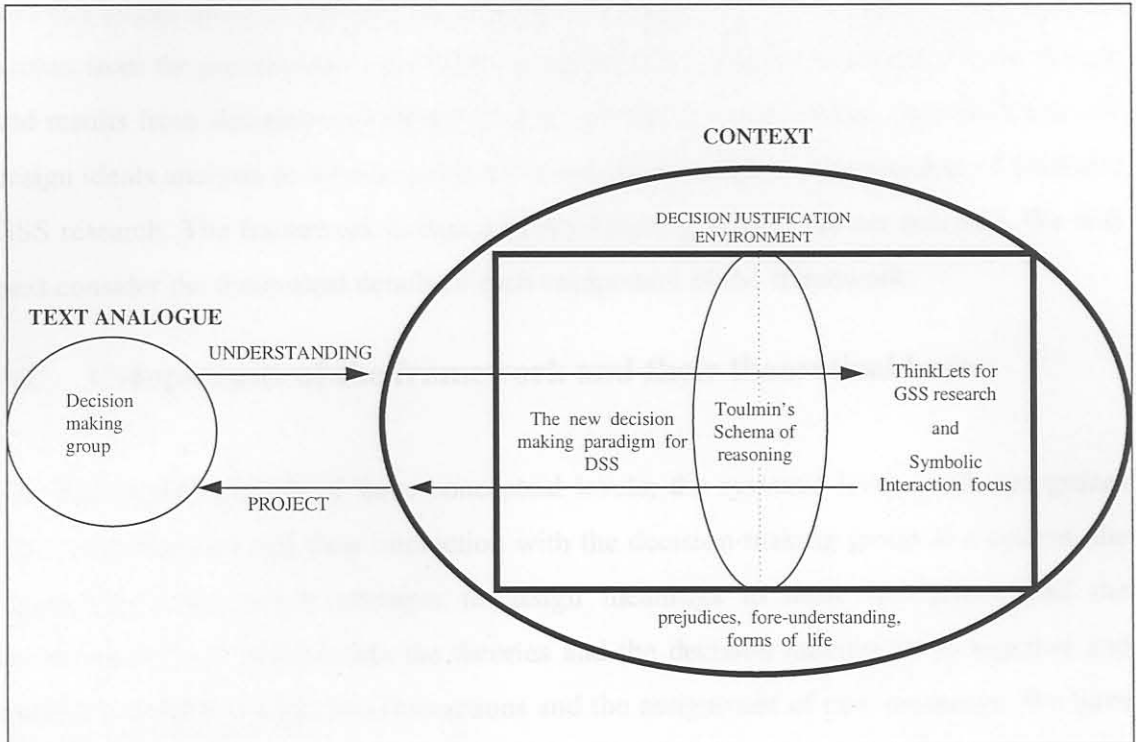


Figure 4.1 (previously 3.3): The systemic-interpretive-hermeneutic research framework

4.1 The evolution and significance of the research framework

A study such as the one we are undertaking here requires multiple levels of analysis. Decision justification at a group level is multi-dimensional. It spans several disciplines and several theoretical and philosophical perspectives. Having identified hermeneutics as the appropriate unifying method of analysis, it became necessary for us to identify from among the various theories we have presented, those that could, in our view, inform and be informed by the decision justification environment within the confines of our research purpose. Courtney's (2001) new decision-making paradigm for DSS, Toulmin *et al.*'s (1979) schema of reasoning and two new strands of GSS research, the one on the use of symbolic interaction (Gopal & Prasad, 2000) and the other on ThinkLets (Briggs *et al.*, 2001) were identified. These theories were then placed in the hermeneutic cycle, to form part of the *decision justification environment*, with Toulmin *et al.*'s *schema of reasoning* forming the core of the *decision justification context*. Our understanding of the decision-

making group will be illuminated through the use of Giddens' structuration theory as presented by Poole *et al.* (1985) and Orlikowski (1992).

The framework enables us to pursue both legs of our research purpose in parallel, with results from one leg enabling a further enhancement of the other in a systemic-interpretive-hermeneutic fashion. It also accommodates our philosophical position that the need for decision justification is an essential component of every group decision-making process and makes it possible for us to further probe into ways of introducing this concept into the group decision-making process as well as to understand what its introduction evokes from the process and what the resulting process entails. And finally, it enables data and results from decision-making groups and interpretive case studies on GDSS use and design ideals analysis to inform and to be informed by the new understanding of DSS and GSS research. The framework is thus a theory-building vehicle for our research. We will next consider the theoretical details of each component of the framework.

4.2 Components of the framework and their theoretical bases

The framework consists of three conceptual levels; the *systemic level* which recognizes the chosen theories and their interaction with the decision-making group as a system, the *interpretive level* which attempts to assign meanings to these interaction, and the *hermeneutic level* which binds the theories and the decision-making group together and enables a circular interpretive interactions and the assignment of new meanings. We have briefly mentioned each of these theories together with others in chapter 2. Now that we have identified them as being central to our study, we will go more deeper into their underlying philosophy and relevance to the problem being studied. As we embark on this activity, we ask the reader to bear with us in instances where we repeat some arguments as well as some diagrams presented earlier. We do this in order to keep these theories within the context of the research framework as well as for ease of reference for the reader, enabling the reader to follow the flow of our arguments. We will, however, keep such

repetitions to a minimum, focusing more on those from which new insight relevant to the research framework could be drawn.

4.2.1 The systemic-interpretive-hermeneutic framework

The Systemic level

The systemic (Daellenbach, 1994 p. 22) level refers to the use of systems ideas in our approach to interpretation in terms of the interacting systems. In this regard, we refer the reader to the section on systems thinking which we have discussed in chapter 2. However, it is important to draw from the work presented there some of the systems ideas which directly relate to the framework. Let us re-look at one of Checkland's ideas:

Checkland (1999) reckons that systems thinking offers an important insight into the role of information systems, the sequence from data to information to knowledge. When one system is thought of as serving another, it is a fundamental principle of systems thinking that in order to think carefully about, and conceptualise the system which provides the support, it is first necessary to define carefully the nature of the system served (Checkland, 1981; Winter et al., 1995). This is necessary because how we see the system served will define what counts as support to it.

This idea suggests that the nature of the *decision-making group* within the decision justification environment needs to be carefully defined because it will define what counts as support to it. It means that GDSS use and design ideals within that environment will be defined by the decision-making group. The systemic perspective therefore does not conceptualise the system being served as separate from the one intended to provide the support. It looks at the system as a whole, that is, the whole framework. So, when we use the word *whole* in this thesis, we are referring to *the systemic whole*. It is important to make this distinction here as there is a broad liberal use of the word at the hermeneutic level, where the word *whole* may refer to the *context*. For our framework, we treat *context* as part of the *systemic whole*.

Other very helpful systemic ideas for the framework which were also presented earlier are:

“...A system is a system inside another, which in turn is a system inside another, etc. All of these systems work together and intertwine to reach or satisfy a specific goal and objective. This is known as an open system. Outputs from one system will be the inputs of another and will influence that system in one or the other way. The system is also influenced by certain external factors that come from various places. According to Daellenbach (1994), systems defined for decision-making purposes are always open systems, since by definition the decisions or the decision-making rules are inputs into the system.” (Daellenbach, 1994, p. 39)

The text-analogue (the decision-making group) on the framework could be considered as a rule producing system for decision-making which the group must consider in their decision-making activities. It also enables the decision-making group to project their understanding onto the decision justification environment, which provides a new meaning to their activities. The outputs from the various theories constituting the decision justification environment (the context) enhances further understanding through interpretation by the group. A group interpretation is, however, at multiple perspective level, which we later describe in some detail in this chapter. This idea establishes links at both theoretical and methodological levels of the research framework.

The critical systemic perspectives of Midgley (1991) and Jackson *et al.* (1991) about *defining system boundaries* and about *establishing boundaries within which* critique can be conducted, as well as complementarism also reinforces the above idea. They recognise the use of more than one theory and more than one method within a single systemic intervention. The concept of ‘otherness’ could be very helpful to the decision-making group as it could assist the group to engage in a *true social dialogue* in sharing their different perspectives. The results of such a dialogue would in turn inform the theories being used.

The interpretive level

We have so far said very little about the interpretive tradition in IS research. Because our philosophical assumptions are underpinned by the interpretive tradition, we will present this level in more detail here. We will draw largely from the work of Walsham (1993, 1995, 2001), Introna (1997), Klein & Myers (1999) and Flood and Ulrich (1990).

According to Klein and Myers (1999), IS research can be classified as interpretive if it is assumed that our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools, and other artefacts. Interpretive research attempts to understand phenomenon through the meanings that people assign to them (Boland, 1985; Deetz, 1996; Orlikowski and Baroudi, 1991). 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, pp. 4 -5).

Looking at our framework, and taking the text-analogue as the “information system” in this last quote from Walsham, the reader can see a complete agreement. This tells us that the research framework is in line with the interpretive tradition, and would thus enable us to analyse the problem following this tradition. Walsham (1993) describes context as being concerned with multi-level identification of the various systems and structures within which the information system is embedded. In the research framework, this context is the decision justification environment. Walsham goes on to point out that a more subtle set of contexts for an information system are the various social structures which are present in the minds of the human participants involved with the system, including designers, users and any of those affected by the system. Their interpretation of reality, their shared and contested sense of the world, create complex interacting contexts within which the information system, as a human artefact, is drawn on and used to create or reinforce meaning. The context in the research framework share all these subtleties. For

instance, the social structures which could be in the minds of the decision-making group if it knows that it has to justify its decisions. According to Walsham, within this broad style of interpretive research, many specific methodologies can be used to guide the information system researcher. We chose critical hermeneutics as the unifying theory and specific mode of analysis. Myers (1994) points out that one of the key differences between a purely interpretive approach and critical hermeneutics is that the researcher does not merely accept the self-understanding of participants, but seeks to critically evaluate the total understandings in a given situation. According to Myers (1994), critical hermeneutics is one of the constitutive process theories referred to by Walsham (1993) as providing a new approach to research on the social aspects of computer-based information systems.

Walsham's (1993, 1995, 2001) work on the use of theory within the IS interpretive tradition stands out. He demonstrates ways in which various theories can be used in the same study to illuminate various aspects. One of his classic examples is where he developed an interpretive approach to understanding 'the process of organisational change associated with a computer-based information system' (Walsham, 1993, p. 52). He developed an analytical framework through which to examine IS case studies which leans heavily on the process view of organisations. He uses Pettigrew's (1985) work to develop the content, context and process as described in the previous paragraph. Following Morgan (1986), he draws on the 'culture' and 'political system' frameworks of organisation in order to examine the *social process* of organisational change; he then draws 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.

The use of various theories in our research framework is partly informed by Walsham's style. It connects perfectly with the systemic and hermeneutic levels, enabling both the

conduct and the evaluation of the study in accordance with Klein and Myers' (1999) set of principles. We present these set of principles later in this chapter.

We also draw on Introna (1997) for the philosophical insight at the interpretive level. Introna uses the work of Heidegger (1962) to argue that in interpretation, understanding “does not become something different. It becomes itself” (Heidegger, 1962, p.118). We can only interpret that which we already understand. In interpretation we do not acquire additional information about what is already understood; rather interpretation is the “working-out of possibilities projected in understanding” (Introna, p. 189; quoting Heidegger, p. 189). In understanding we already have a primordial sense or reference in the form of an already there network of for-the-sake-of-whichs or of in-order-tos about ourselves and our tools within the referential whole. However, this primordial understanding can be further interpreted in such a way that the ready-to-hand comes explicitly into that sight which understands it. This is accomplished by the taking part, as it were, of the in-order-tos that are already circumspectively understood, and concerning ourselves with what becomes visible through this process. This in-order-to that is now explicitly understood has the structure of something *as* something - as a thing for doing this or for doing that. Drawing on this, Introna concludes that it follows that interpretation is the laying out, the making explicit, as this or that. He again quotes Heidegger (*op. cit.*) who indicate that the ‘as’ constitutes the interpretation; it makes up the structure of the explicitness of something that is understood. He uses the following example: If asked “what is this?”, we can answer (explain or interpret), that it is something which functions as this or as that - we take it to be a chair or a table or a pointer. This, according to Introna, is why Heidegger argues that, in interpretation, understanding does not become something else; it becomes itself; it makes explicit its own possibilities to as this or as that.

This philosophical insight makes two points clearer. The first is that interpretation does not have access to itself. It cannot start without prior understanding of that which is to be

interpreted. The second is that when we use “as”, “in-order-to”, “for-the-sake-of”, we are actually expressing an understanding through interpretation - an understanding of the “text” whose meaning we are seeking. In other words interpretation lead to or restore understanding. According to Inrona (1997, pp.76-77), continued interpretation will lead to *in-sight* and, if persistent, to wisdom - that is, being able to act sensibly within the possibilities made explicit by the process of interpretation. This additional insight would assist us in our analysis, especially of empirical data. There is, however, still a sticking point here - how does this wisdom assist the justification process? What makes these sensible acts sensible?

We found the work of Flood and Ulrich (1990) on interpretivist rationality very useful here. According to these authors, interpretivists introduce the idea that a specific action concept can be transparent only in the context of a certain set of *social* rules. It is in terms of these that an actor can be said to be doing some particular thing:

‘ “Beyond” an observation, we are told, is a *set* of social rules, a *social practice*, that can be drawn upon to explain the action.’ (Flood and Ulrich, 1990).

They indicate that the interpretivist also introduces a third layer, that of *constitutive meaning*. According to Flood and Ulrich (1990), this is the least accessible layer to the actors, for as a social practice lies behind an observation, a constitutive meaning lies behind the social practice. It is in terms of these meanings that people speak and act. They suggests that in order that these meanings can be more fully appreciated, it is necessary for an actor to adopt a contrasting constitutive meaning and thus “take a look” at his/her own view from “the outside.” In this, admittedly difficult way, it is possible to “get a handle” on one’s own reality.

“An interpretivist social theorist is not, therefore, concerned with privileging views by asking questions such as “What is the correct action in a certain social context (typical of what a scientific view would be)?” Rather than asking what is appropriate, an

It seems to us that these three layers of interpretive analysis could provide some guidelines to a decision-making group within the decision justification context. What appears to be necessary is a very specific *social practice* - a practice that we could call a *decision justification social practice*, which would define the *nature of the decision* being made. Such a social practice would enable us to formulate some fundamental *a priori* assumptions for decisions falling within this social practice. It is our argument here that such a social practice is possible, and should, in our view be a deliberate effort of awareness raising through a particular kind of training. We propose such a particular kind of training in the next chapter, with Toulmin *et al.*'s schema of reasoning (discussed below) playing a central role as shown in the research framework. If decision-making groups could always approach their decision-making with this *decision justification social practice* in mind, there may be many benefits for society from this practice. We acknowledge, however, that such a social practice may be politically inconvenient, but social practices need not be politically convenient. As they are valued and practised by society, there could be many instances where those with particular political interests might find such a social practice beneficial.

The hermeneutic level

This is the level underpinning and unifying our research framework. It is based on the principle of the hermeneutic circle as part of philosophical hermeneutics developed by Gadamer (1989). Introna (1997) uses Gadamer's work, together with that of Heidegger (1962), Wittgenstein (1956) and Boland (1983) to arrive at hermeneutic conclusions about information.

The hermeneutic circle is one of the most important conceptual contributions offered by hermeneutics (Introna, 1997; p 65). It expresses the principle that one must understand the parts from the whole and the whole from the parts. As Gadamer (1989, p.259) explains it:

“The anticipation of meaning in which the whole is envisaged becomes explicit understanding in that the parts, that are determined by the whole, themselves also determine this whole”.

The circle works as follows:

We *project* significance onto the text, based on the form of life within which we interpret; we then allow the text to inform the tradition, which is the living context from which we seek to understand. In the hermeneutic circle, we continually adjust our point of view, perspective or horizon, always within our tradition and situation, in an effort to fuse these points of view, perspectives or horizons. We do this in order to achieve understanding and in order to maintain a living and current form of life.

According to Introna (1997), the circle starts in a heuristic manner. The interpreter uses her fore-understanding and prejudices to establish the initial meaning of the text; assuming it to be in some way coherent and understandable. She then relates this meaning to her current situation, tradition or form of life. She now possesses a new understanding of her context; this new understanding is projected back on to the text which opens up new meaning to be projected back to the context. This movement to and fro between the text (the part) and the context (the whole) creates possibilities for understanding, but only if the interpreter persists and continually opens herself to the text. Introna, again quoting Gadamer, calls the circle the dialectic process of understanding, saying that the movement to and fro, “(the) harmony of all details with the whole is the criterion of correct understanding. The failure to achieve this harmony means that understanding has failed” (Gadamer, 1989, p. 259).

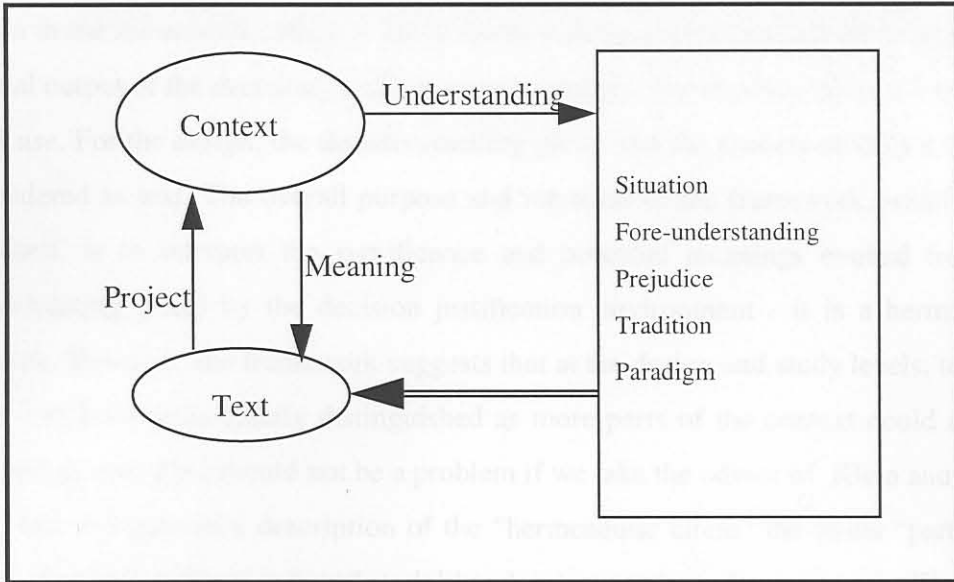


Figure 4.2: (previously 2.5) :The hermeneutic circle (adapted from Introna ,1992, p. 2.25)

Walsham (1993) quotes Boland (1985), who used the work of Gadamer (1975) to relate hermeneutics to phenomenology as follows:

“Gadamer focuses our attention on phenomenology as an historic act of interpretation, grounded in tradition. He emphasizes the impossibility of stripping away all assumptions as a guarantee of objective knowledge. For Gadamer, prejudice is a positive not a negative thing. Prejudice is the basis of our ability to experience the world ... Understanding ... is a moving dialectic process: a dialogue in which we continuously engage all that is alien to us in a reciprocal, intersubjective relation ... Gadamer argues that the hermeneutic process of interpretation is not some esoteric problem relevant only to translators of ancient text, but a basic problem that confronts us all as part and parcel of our existence in the social world.” Walsham (1993, p. 9)

He also quotes Boland on the application of hermeneutics to the study of information systems as follows:

“... the use, design and study of information systems is best understood as a hermeneutic process ... In *using* an information system, the available output is a text that must be read and interpreted by people other than its author. This is a hermeneutic task. In *designing* an information system, the designer reads the organisation and its intended users as a text in order to make an interpretation that will provide the basis for a system design. This is also a hermeneutic task. In *studying* information systems, social scientists read the interaction during systems design and use in order to interpret the significance and potential meanings they hold. Hence, doing research on information systems is yet another hermeneutic task.” (Walsham, 1993).

The last quote perhaps underlines the appropriateness of hermeneutics as both the philosophical basis and an analysis mode for this study. Drawing on this quote, the text-analogue in the framework, which is the decision-making group, could be exchanged with the actual output of the decision justification environment; for example the text from DSS or GSS *use*. For the *design*, the decision-making group and the process of GSS use could be considered as text. The overall purpose and intention of the framework, which is the study itself, is to interpret the significance and potential meanings evoked from the decision-making group by the decision justification environment - it is a hermeneutic framework. However, the framework suggests that at the design and study levels, text and context will have to be clearly distinguished as more parts of the context could also be considered as text. This should not be a problem if we take the advice of Klein and Myers (1999), that in Gadamer’s description of the “hermeneutic circle” the terms “parts” and “whole” should be given a broad and liberal interpretation. According to Klein and Myers, they can be parts of a historical story, and then the whole is the proper perspective of the historical context. Alternatively, the parts can be the interpretive researcher’s and the participants’ preliminary understanding (i.e., pre-understanding) in the study. The whole consists of the shared meaning that emerge from the interaction between them. (Klein and Myers, 1999). In our framework, these terms correspond to “text-analogue” and “context”. We will take this broad and liberal interpretation when using these terms,

especially in our analysis of empirical data. As mentioned earlier, we treat “text” and “context” as forming a systemic whole.

The hermeneutic way of structuring and processing information could be a helpful way of sharing understanding and meaning by a group during its decision-making process. The shared understanding and meaning could form a significant part of the justification process. Introna captured this aspect by constructing an “understanding and multiple perspectives” way to view the concept of the hermeneutic circle (Introna, 1992, p. 2.26).

Here the hermeneutic circle is seen as the generation of multiple perspectives. The first perspective is based on current understanding and prejudices. According to Introna, the interpretation will try and render it coherent with this understanding. If this is not possible, the perspective must be adapted for a new understanding to be possible. The new understanding becomes the new perspective that is again projected onto the text from which emerges a new meaning and thus an expanded understanding. Introna notes that this process of repeated and reiterated projection of perspectives onto the text will expand the interpreter’s understanding of the text. However, if the process is prematurely terminated (the interpreter closes to the text) then the interpretation and thus the understanding is incomplete and to a degree subjective.

It has already been indicated that because the hermeneutic circle is not a vicious circle, subjectivity cannot be avoided. It is not an evil, but an essential ingredient in the process. According to Introna, it is the interpreter’s responsibility to use it creatively and also to struggle beyond it towards the never-ending possibility of further interpretations. The multiple perspective view of the hermeneutic circle can be seen in Figure 4.3.

This alternative description of the hermeneutic circle as presented by Introna (1992) would be helpful in a group decision justification environment, where the need for a dialogue is not optional. In a dialogue, each partner in the dialogue injects a new

perspective and places all participants in a hermeneutic circle. According to Introna, the dialogue is not the joint interpretation of a given text, but the interaction in the production of a continually changing text; where the text itself and not just the interpretation mutates.

In order to adequately analyse the group decision justification process, it is compelling to also look at the characteristics of the *social dialogue* as it partly describes the nature of the decision-making group. This social dialogue would form part of the *social practice* discussed earlier.

According to Gadamer (1989) (quoted in Introna, 1997, p. 67), true dialogue has the following characteristics:

- a. Two or more participants committed to the process;
- b. The acknowledgment by both parties that they individually do not have complete understanding, as this would eliminate the need for dialogue;
- c. Both participants take seriously the truth-claims of the other party and do not try to destroy the other party's position;
- d. The reciprocal illumination of positions by the other party;
- e. If successful, the conclusion of the dialogue should take the participants beyond their original points of view in the sense that these are transformed or consolidated by the encounter with the alternatives.

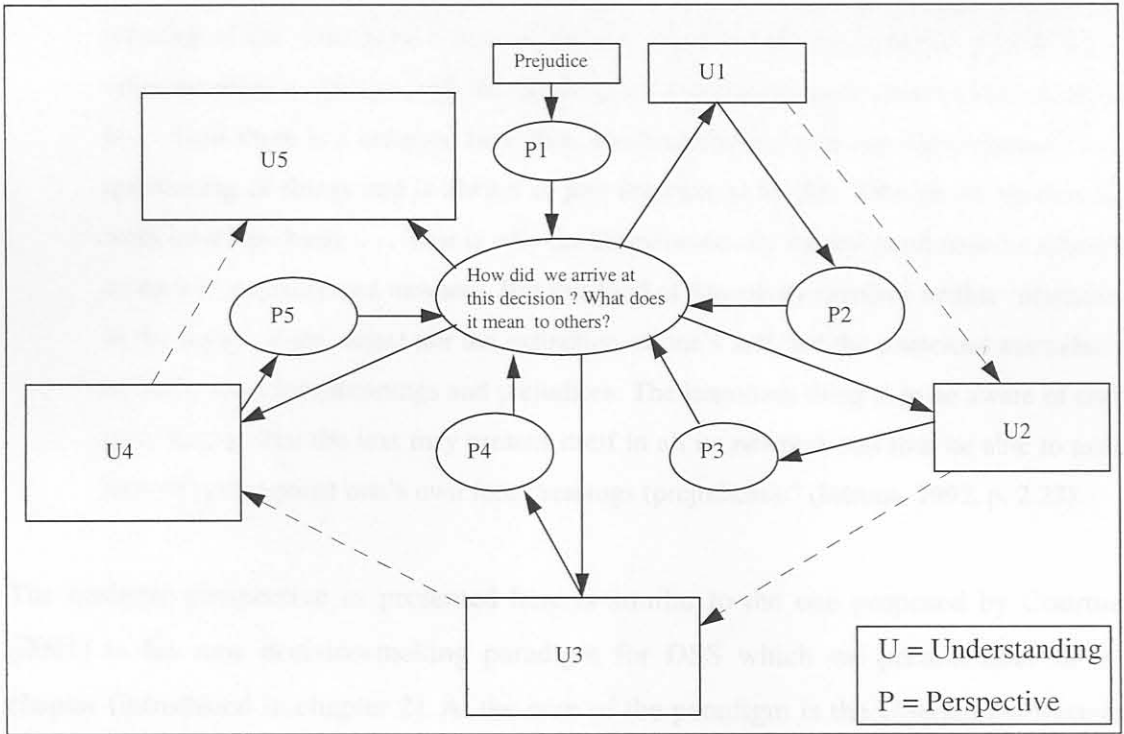


Figure 4.3 Understanding and Multiple Perspectives (adapted from Introna, 1992, p. 2. 26)

One could say that in a decision justification environment, a decision-making group operates at three levels of understanding:

- at the *individual* level through self understanding,
- at *group level* through shared understanding and
- between the group and *others* seeking an equal level of understanding with the group.

In this sense we have a *triple hermeneutic* process in any decision justification process by groups to others and a *double hermeneutic* process amongst the group members themselves in their search for a shared understanding.

Once the group has reached this shared understanding amongst the group members themselves, two levels of understanding would have been achieved; the *individual* and the *group* level. The remaining level of understanding would be that of *others* seeking an

equal level of understanding with the group. The greatest complexity, however, lies in attaining and maintaining this shared understanding by the group itself. Although complex, this level of understanding is attainable, as long as the group continuously opens itself up to new text generated by *others*. There is a stopping criterion as well. Introna (1992) quotes Gadamer as follows:

“If we examine the situation (of the possibility of misunderstanding the text) more closely, however, we find that meanings cannot be understood in an arbitrary way. Just as we *cannot continually misunderstand* the use of a word without its affecting the meaning of the whole, so we cannot hold blindly to our own fore-meanings (and prejudgments) of the things if we would understand the meaning of another. Of course this does not mean that when we listen to someone or read a book we must forget all our fore-meanings concerning the content, and all our ideas. All that is asked is that we remain open to the meaning of the other person or text. *But this openness always includes our placing the other meaning in relation with the whole of our own meanings or ourselves in relation to it.* . . . Thus there is a criterion here also. The hermeneutic task becomes automatically a questioning of things and is always in part determined by this. This places hermeneutic work on a firm basis. . . . That is why the hermeneutically trained mind must be sensitive to the text’s quality and newness. But this kind of sensitivity involves neither ‘neutrality’ in the matter of the object nor the extinction of one’s self, but the conscious assimilation of one’s own fore-meanings and prejudices. The important thing is to be aware of one’s own bias, so that the text may present itself in all its newness and thus be able to assert its own truth against one’s own fore-meanings (prejudices).” (Introna, 1992, p. 2.23).

The multiple perspective as presented here is similar to the one proposed by Courtney (2001) in his new decision-making paradigm for DSS which we present later in this chapter (introduced in chapter 2). At the core of the paradigm is the Unbounded Systems Thinking (UST), whose basis is the development of multiple perspectives, a critical aspect of which is open, honest and effective dialogue among all relevant stakeholders in the problem involved.

The three levels described above (*systemic, interpretive, hermeneutic*) are neither sequential nor separable, at least from our point of view. They intertwine, and in other

cases even overlap completely. Although these levels are theoretically significant in the sense that they are always present in the framework, we will not attempt to distinguish them when using the framework in interpreting empirical data. They serve as our mental models. This concludes what we could call the meta-theoretic overview of the research framework. We now separately look at each component and its underlying theory.

4.2.2 The decision-making group

We borrow from Giddens' (1984) structuration theory through the work of Poole *et al.* (1985) and Orlikowski (1992) to give the theoretical perspective of this component of the framework. We start by revisiting some of the ideas from Poole *et al.* (1985) presented in chapter 2, followed by Orlikowski's work. We then relate this component (the "text") to each component within the decision justification environment (the "context") in a "pair-wise" fashion as shown in Table 4.2. This is done in order to keep our analysis manageable. We can therefore say that the research framework is founded on two theoretical bases; Giddens' (1984) structuration theory and Toulmin *et al.*'s (1979) schema of reasoning. These foundations are linked through a hermeneutic process, informed respectively by the work of Poole *et al.* and Orlikowski (decision-making group); and Courtney (the new decision-making paradigm for DSS), Briggs *et al.* (ThinkLets for GSS), and Gopal and Prasad (Symbolic interaction for GSS). By keeping the pair-wise analysis approach, we can present the respective subsystems as in Figures 4.4, 4.5, 4.11, 4.13 and 4.14.

Poole *et al.* (1985), argued that the subject is not a basic unit of action, but rather a produced and reproduced position in a field of structuration. They hold that groups can *act*, and that they can produce and reproduce social structure in the course of acting. They argue that neither our culture nor a considered perspective on the nature of action *requires* that individual persons be the only units capable of acting.

Table 4.2: “Pair-wise” sequence of framework application in the analysis process

	Systemic - Interpretive - Hermeneutic levels				
	1	2	3	4	5
Decision Justification Environment (Context)	Toulmin <i>et al's</i> schema of reasoning	Toulmin <i>et al's</i> schema of reasoning	Toulmin <i>et al's</i> schema of reasoning Courtney's new decision-making paradigm for DSS	Toulmin <i>et al's</i> schema of reasoning Briggs <i>et al.'s</i> thinkLets for GSS research	Toulmin <i>et al's</i> schema of reasoning Gopal and Prasad's focus on Symbolic interaction for GSS
Group decision-making (“text”)	Giddens Orlikowski Poole <i>et al.</i> without technology	Giddens Orlikowski Poole <i>et al.</i> with technology	Giddens Orlikowski Poole <i>et al.</i> with technology	Giddens Orlikowski Poole <i>et al.</i> with technology	Giddens Orlikowski Poole <i>et al.</i> with technology

They hold that action at group level takes place in those instances where members find it appropriate and comfortable to use the first person plural (e.g., “We already decided”).

“.....but that choice must be justified theoretically and empirically, as an outcome rather than a presupposition of research” (Poole *et al.* (1985)).

We indicated that this statement is at the heart of our research and we posed and partially answered the following question (see chapter 2):

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

The complete answer seems to lie in the *decision justification social practice* - a social practice that encompasses a method for surfacing the *constitutive meanings* of all group members as they enter into a rational discourse on the decision task. We discuss such a decision justification social practice in chapter 6.

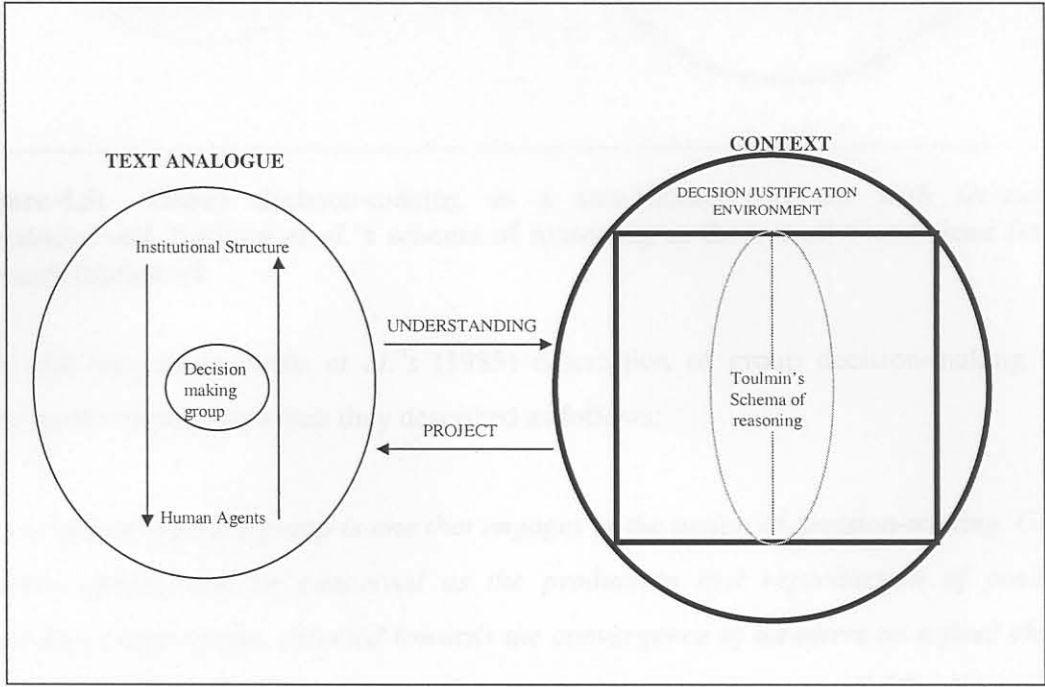


Figure 4.4: Group decision-making as a structuration process and Toulmin *et al.*'s schema of reasoning as theoretical foundations for the research framework

Following Poole *et al.*'s (*op.cit.*) argument that groups can act, that they, rather than actors, can be units of social scientific analysis, we take the decision-making group as our unit of analysis and adopt their definition of a group:

Definition: A group is that which acts as a group. Only a group can validate an internal role structure or make a social decision, so when a set of people take, or prepare to take such action, they are a group.

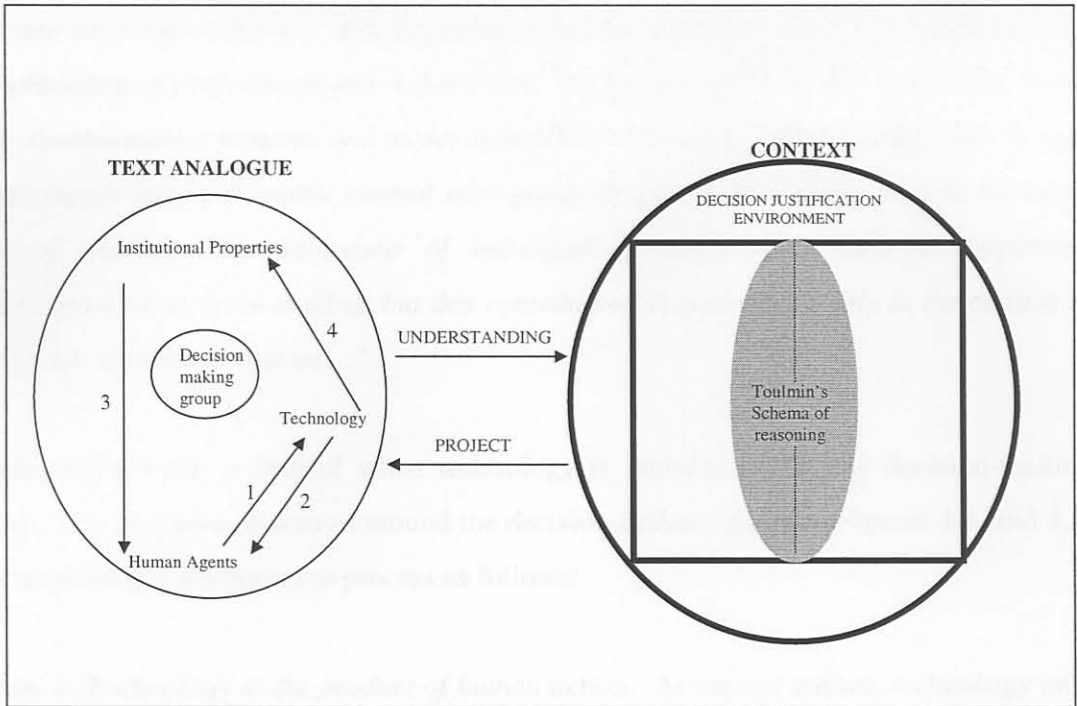


Figure 4.5: Group decision-making as a structuration process *with technology* introduced and Toulmin *et al.*'s schema of reasoning as theoretical foundations for the research framework

We will also adopt Poole *et al.*'s (1985) description of group decision-making as a structural process which they described as follows:

"... A decision-making group is one that engages in the action of decision-making. Group decision-making can be conceived as the production and reproduction of positions regarding group action, directed towards the convergence of members on a final choice. We focus on three elements of group decision-making in order to track this convergence: members' expression of preferences and the negotiation of preference orders; argumentation as a means of advancing and modifying premises and preferred orders; and strategic tactics members employ to win assent for their proposals. We call these three elements message aspects. In advancing the above message aspects, all the three modalities of structuration are involved- language, norms, and power. Positions are developed through the expression of preferences (valence) and through argumentation

supplying substantiation for personal leanings. The move towards group convergence is accomplished via the accumulation of verbalized preferences and reasons, and also by the strategies used to manage the accumulation process.

To constitute the three modalities in the group context, the levels of interaction are complemented by three constructs often utilized in traditional group research - group communication, group decision rules, and power structures. These “variables” are reconceptualized as structural elements, continually produced and reproduced in group interaction, thereby becoming both the medium and outcome of group decision practices. As enacted through the three types of messages above (preferences, argumentation, tactic), group interaction invokes, constitutes, and reproduces interpretive schemes relevant to group decisions; decision rules serves as normative structures regulating the accumulation of preferences and reasons and “transforming” them into group decisions; and communication patterns and power structures are facilities that (among other things) shape inputs into and enable control over group decisions. The group itself is the basic unit of analysis. The behaviour of individual members does make an important contribution to decision-making, but this contribution is meaningful only in the context of the group interaction system ...”

Orlikowski’s work is helpful when technology is introduced into the decision-making group. This is shown as arrows around the decision-making group in Figures 4.4. and 4.5. She explains the structuration process as follows:

Arrow 1: Technology is the product of human action. As human artifact, technology only comes into existence through creative human action, and is sustained by human action through the ongoing maintenance and adaptation of technology (automobiles need servicing, typewriters require new ribbons, and even pencils need sharpening). Further, human action constitutes technology through using it. That is, once created, technology is deployed in organisations but remains inanimate and hence ineffectual unless it is given

meaning and is manipulated - directly or indirectly - by humans. On its own, technology is of no import; it plays no meaningful role in human affairs. It is only through the appropriation of technology by humans (whether for productive or symbolic ends) that it plays a significant role and hence exerts influence. It is only through human action that technology *qua* technology can be understood.

The interpretive flexibility of technology operates in two modes of interaction. In the *design mode*, human agents build into technology certain interpretive schemes (rules reflecting knowledge of the work being automated), certain facilities (resources to accomplish that work), and certain norms (rules that define the organisationally sanctioned way of executing that work). In the *use mode*, human agents appropriate technology by assigning shared meanings to it, which influence their task execution. In many organisations, individuals may have little control over when or how to use technology, and hence little discretion over which meanings and elements influence their interaction with it. But these constraints are institutional, and are not inherent in the technological artifact itself. Users can always choose (at the risk of censure) not to utilize a technology, or choose to modify their engagement with it. The notion that technology needs to be appropriated by humans retains the element of control that users always have (however slight) in interacting with technology.

Arrow 2: Technology is the medium of human action. Because technology is used by workers, it mediates their activities. Anyone who has used a typewriter, telephone, hammer, or pencil can attest that technology facilitates the performance of certain kinds of work. That the technology also constrains the performance by facilitating it in a particular manner is an important corollary of this. This influence resembles that posited by earlier examinations of the “impacts of technology” on the use of technology. However, there are two significant differences in the structural model. One is the recognition that technology cannot determine social practices. Human agency is always needed to use technology and this implies the possibility of “choosing to act otherwise.” Thus,

technology can only condition social practices. The other difference is the acknowledgment that technology, in conditioning social practices, is both facilitating and constraining. Technology does not only constrain or only enable, it does both. This dual influence has typically not been recognized in studies that attempt to determine definitively whether technology has “positive” or “negative” effects (Attewell and Rule, 1984; Hartmann *et al.*, 1986). Giddens’ (1984) framework allows us to recognize that technology - as a medium of social practice - necessarily has both restricting and enabling implications. Which implication dominates depends on multiple factors including the actions and motives of designers and implementers, the institutional context in which technology is embedded, and the autonomy and capability of particular users.

Arrow 3: Institutional conditions of interaction with technology. This influence concerns the nature of human organisations, which is situated action, and hence shaped by organisational context. When acting on technology (whether designing, appropriating, modifying or even testing it), human agents are influenced by the institutional properties of their setting. They draw on existing stocks of knowledge, resources, and norms to perform their work. Often these influences are unarticulated, or reflected on only fleetingly by human agents (Giddens, 1984), and are here referred to as the *institutional conditions of interaction with technology*. Technology is built and used within certain social and historical circumstances and its form and functioning will bear the imprint of those conditions.

Arrow 4: Institutional consequences of interaction with technology. This final influence involves the manner in which human action when it uses technology acts upon the institutional properties of an organisation, either by reinforcing them (more typically) or by transforming them (less frequently). Technology is an “enacted environment” (Weick 1979, p. 260) whose construction and use is conditioned by an organisation’s structures of signification, domination, and legitimation. The appropriation and use of technology implies the change or reinforcement of these three institutional structures. These effects –

comprising the *institutional consequences of interaction with technology* - are often not reflected on by users, who are generally unaware of their role in either reaffirming or disrupting an institutional *status quo*. When users conform to the technology's embedded rules and resources, they unwittingly sustain the institutional structures in which the technology is deployed.

When users do not use the technology as it was intended, they may undermine and sometimes transform the embedded rules and resources, and hence the institutional context and strategic objectives of the technology's creators, sponsors, and implementors. This may happen more frequently than one would imagine. Perrow (1983) and Wynn (1988) show how users operating complex technologies often have to deal with high levels of stress, ambiguities, and unstructured local situations that deviate from "normal" operating conditions. In these situations the negotiated or enacted use of technology is often very different to the prescribed, mechanical operation of the technology. Tyre's (1988) study of process technology includes the case of a new grinding machine being introduced into an automated manufacturing plant. Initial integration problems forced project engineers to install a temporary manual "workaround." Although the manual workaround was inefficient, operators quickly learned to depend on it to accomplish their work. Later, when the grinder was fully functional, operators prevented the engineers from dismantling the "temporary" workaround. The new technology with its workaround has become so integrated into operators' routine that it became the "normal" or institutionalized mode of operating the grinding machine.

Poole *et al.*'s work will assist us in describing and interpreting the group decision-making process while Orlikowski's would help us in interpreting the interaction between the decision-making group (the text-analogue) and each of the components with the decision justification environment (context), since each of these components has to do with technology.

We are aware of Jones' (1999) critique of the use of structuration theory when technology is introduced. His critique, however, does give some merits to Orlikowski's work that we are using in this study.

4.2.3 The decision justification environment

The decision *justification environment* constitutes the *context* of the research framework while the decision-making group constitutes the *text-analogue*. The systemic whole includes both. Our aim through hermeneutic analysis is an attempt to make sense of the decision-making group in the context of a decision justification environment. The key question here is what does a decision-making group mean in a decision justification context? More specifically, what do the theories mean to the decision-making group? Next we give the details of the chosen theories and then attempt to relate them pair-wise to the two questions.

Toulmin *et al.*'s schema of reasoning

We will introduce what we will henceforth refer to as Toulmin *et al.*'s *schema of reasoning*. We do this in some detail as it forms the foundation of our analysis framework. In the next chapter, we will compare the elements of the schema with explanations from various theories presented in this chapter and earlier. Some of our research questions raised in chapter 3 which are answered during this comparison process are clearly identified and highlighted.

Reasoning and its goals

According to Toulmin *et al.* (1979), when certain types of utterances, assertions or claims are made, it is expected of us to support them by giving reasons. The process of giving reasons is called *reasoning*. The importance of reasoning is perhaps best introduced by the following example given by Toulmin *et al.*:

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‘ a guest professor was directing a seminar when a student asked him, “Professor Black, the statement you just made is quite different from what you said this morning. Aren’t you contradicting yourself?” The professor simply answered, “No”, and proceeded to relight his pipe. The students waited, expecting him to add reasons in support of this negative response as soon as the pipe was going again. Instead the professor looked up and remained silent, as if waiting for the next question. The group shuffled nervously, and finally there was embarrassed laughter. Later on, the student who asked the question was heard to say he felt that the professor had put him down. He was angry. The professor had violated a strong social demand requiring him to provide reasons for disagreeing with his questioner’ (Toulmin et al., 1979, p. 4).

It is evident from this example that reasoning - or at least the giving of reasons - is pervasive in our society. The practice of providing reasons for what we do, or think, or tell others we believe is built firmly into our accepted pattern of behaviour. This is so much the case that situations in which people fail to supply voluntarily the reasons we are expecting can be shocking or humorous as seen in the example above.

Varied use of language : The use of language in reasoning is a central theme of much of science and philosophy. People put language to use in innumerable ways and for innumerable purposes, and not all of these by any means involve the offering of and evaluation of “reasons”. We use language to move, persuade, or convince one another; to exchange and compare perceptions, information, or reactions; to command, greet or to negotiate and arrive at understandings and so on. There are thousands of human transactions in everyday life that often put little, if any, emphasis on the giving and evaluating of reasons. So even though we put a high priority for many purposes on being able to supply reasons for claims, there are plenty of situations in which that demand is set aside. People are normally not asked to give reasons for things that they say they believe in. If they are, they often simply decline to engage in any further argument. For instance one may respond in the following way: “ It is enough that I believe in it, and I do not care if you do”. We treat many sensitive subjects in a similar way.

Toulmin *et al.* distinguish between two types of language uses. They call them *instrumental* and *argumentative* uses of language. *Instrumental* uses are those utterances that are supposed to achieve their purpose directly, as they stand, without the need to produce any additional “reasons” or “supporting arguments”. For example, greeting a friend or giving a command. *Argumentative* uses are those utterances that succeed or fail only to the extent that they can be “supported” by arguments, reasons, evidence or the like, that are able to carry the reader or the hearer along with them only because they have such a “rational foundation”. *Argumentative* utterances initiate *trains of reasoning*. These trains of reasoning are equivalent to various *justification contexts* of our research problem. The only difference is that in the justification contexts, we are looking at trains of reasoning in support of *decisions* rather than ordinary claims or utterances.

Reasoning varies with situations: Trains of reasoning varies from situation to situation. The kind of involvement that the participants have with the outcome of the reasoning is entirely different in the different situations and so also will be the way in which possible outcomes of the argument are tested and judged. However, in all these varied situations there are certain general features that are common which we will discuss in the second half of this chapter. According to Toulmin *et al.* (1979, p 8), initial claims resemble a kind of “building” whose reliability depends upon its being “supported” by sufficiently solid “foundations”. In all the different kinds of situations and dealing with all the different kinds of problems, the same set of questions can, according to Toulmin *et al.*; always be raised:

What does the giving of reasons achieve?

How do the different statements embodied in any train of argumentation succeed in supporting one another?

What makes certain reasons or considerations relevant in supporting any particular claim, while other considerations would be beside the point?

How is it that some supporting reasons are strong, while others are shaky?

Toulmin *et al.* regard this family of questions as defining the topics involved in the critical study of argumentation or reasoning. They invite us to ask how we should embark on the task of setting out any such “argument” for analysis, so that we can recognise for ourselves:

How it is put together, what elements it is composed of, or how these different elements are related to one another? And

What bearing, if any, those relations have, either on the strength of the entire argument or on the acceptability of the claim under criticism.

There is a clear relationship here between some aspects of the research questions we have raised in chapter 3 and the above sets of questions raised by Toulmin *et al.* We will use these comparative sets of questions in the next chapter, after we have followed the entire *schema of reasoning* of Toulmin *et al.*

Reasoning as a critical transaction: The essential locus of reasoning is according to Toulmin *et al.*, seen to be *public, interpersonal, or social*. Wherever an idea or a thought may come from, it can be examined and criticised “rationally” - by the standards of “reason” - only if it is put into a position where it is open to public, collective criticism. Reasoning is thus not a way of *arriving at ideas* but rather a way of *testing ideas critically*. It is concerned less with how people think than with how they share their ideas and thoughts in situations that raise the question of whether those ideas are *worth* sharing. It is a collective and continuing human transaction, in which we present ideas or claims to particular sets of people within particular situations or contexts and offer the

appropriate kinds of “reasons” in their support. It involves dealing with claims with an eye to their contexts, to competing claims, and to people who hold them. It calls for the critical evaluation of these ideas by shared standards (without necessarily assuming universal/eternal standards); readiness to modify claims provisionally accepted and of any new ones that may be put forward subsequently.

Reasons and arguments that appear quite acceptable and proper to one group may be successfully challenged when discussed within other groups. Ideas which are strongly shared by all those with whom we are in immediate contact may not have needed to generate any substantial body of reasons in support of them. It is sufficient that those whom we respect have advocated them. When this happens, the result is that we deprive ourselves of an opportunity to prepare for a possible challenge to our most cherished ideas and beliefs, which according to psychologists, we are liable to either abandon rather quickly for lack of appropriate reasons, or fall back on some inflexible dogmatic position. According to Toulmin *et al.*:

“In fact a suitable process of “inoculation”, by which we expose our most cherished ideas to systematic attack and begin on the task of building up a more adequate body of reasons in advance of a serious challenge, may allow us to develop our critical faculties in a way that prepares us to deal more robustly with future attacks on our beliefs.” (Toulmin *et al.*, *op. cit.*, p.11).

Reasoning comes into play as a means of providing support for our ideas when they are open to challenge and criticism. This does not mean that procedures of reasoning always take place later in time than the formation of the ideas that call them forth. We often begin to test our ideas in a critical manner and think over the available reasons for or against them as soon as we first have the ideas. In a form of thinking that may be called *intrapersonal communication*, we imagine ourselves sharing an idea with other people and rehearse the questions they might ask and the challenges they might make to our supporting reasons. In the course of this rehearsal, we may be able to refine and improve

on the reasons in support of the idea, and so we finally arrive at a point where we can “go public”, confident in our ability to justify it. Or alternatively we may find ourselves recognizing so many arguments against the idea that we decide to forget it altogether or never to make it public. In either case, the “*transactive*” character of reasoning is preserved.

Toulmin *et al.*'s schema of reasoning : the 'basic pattern of analysis'

According to Toulmin *et al.* (1979, p.v), the basic pattern of analysis as introduced here is suitable for application to arguments of all types and in all fields, including justification of claims made by groups.

We begin by adopting the following definitions from Toulmin *et al.*:

The term *argumentation* will be used to refer to the whole activity of making claims, challenging them, backing them up by producing reasons, criticizing those reasons, rebutting those criticism, and so on.

The term *reasoning* will be used, more narrowly, for the central activity of presenting the reasons in support of a claim, so as to show how those reasons succeed in giving strength to the claim.

An *argument*, in the sense of a *train of reasoning*, is a sequence of interlinked claims and reasons that, between them, establish the content and force of the position for which a particular speaker is arguing.

Anyone participating in an argument shows his *rationality*, or lack of it, by the manner in which he handles and responds to the offering of reasons for or against claims. If he is “open to argument”, he will either acknowledge the force of those reasons or seek to reply

to them, and either way he will deal with them in a “rational” manner. If he is “deaf to argument”, by contrast, he may either ignore contrary reasons or reply to them with dogmatic assertions, and either way he fails to deal with the issue “rationally”.

With this vocabulary and terminology, we are now ready to embark on the “basic pattern of analysis” for identifying and describing the strengths and weaknesses of arguments.

The critical questions about an argument

At the outset of a fully reasoned argument, one of the parties involved - the *assertor*, or A - presents a “claim”, C. The assertor (A), must do more than put forward his position as a bare assertion (“Take it or leave it”) if he is to make the claim on a “rational” basis - as the opening move in a possible argument - rather than as a simple personal opinion. If his position is to be open to criticism and discussion by others, A must have further grounds, reasons, or other considerations, which can be added (if necessary) to demonstrate that the claim is “well founded”, that it is a claim whose acceptability can be acknowledged reasonably by other people also. In the absence of further support and clarification, other parties to the discussion may be in no position to share the assertor’s view of the matter.

On the other hand, the individual who leads the criticism of A’s claim, the questioner (Q) will require A to bring to the surface, and make explicit, that set of supporting reasons by which he can explain, spell out, and/or justify his position. Q must press his questions clearly enough and in enough detail for other parties to judge whether A has made his case and given them reasons to acknowledge, for themselves, that his initial assertion was *sound* or *solid*. If Q’s examination brings the discussion to a point at which all parties are in a position to acknowledge the force of A’s reasons, then this particular “argument” will have been completed. At this point in the argument, *either* the other parties to the discussion will be ready to endorse A’s claim, *or else* they will agree that, given A’s

argument, the initial claim would be sound, provided that the supporting facts are really as A alleges.

The elements of any argument

Toulmin *et al.* identify six elements that can be found in any wholly explicit argument. These are: *Claims, Grounds, Warrants, Backing, Modal qualifications, Possible rebuttals.*

Claims: When we are asked to embark on an argument, there is always some ‘destination’ we are invited to arrive at, and the first step in analyzing and criticizing the argument is to make sure what the precise character of that destination is. So the first set of questions is

What exactly are you claiming? Where precisely do you stand on this issue? What position are you asking us to agree to as the outcome of your argument?

Grounds: Having clarified the claim, we must consider what kind of underlying foundation is required if a claim of this particular kind is to be accepted as solid and reliable. The next set of questions will therefore have to do with these foundations:

What information are you going on? What grounds is your claim based on? Where must we ourselves begin if we are to see whether we can take the step you propose and so end by agreeing to your claim?

Depending on the kind of claim that is under discussion, these grounds may comprise experimental observations, matters of common knowledge, statistical data, personal testimony, previously established claims, or other comparable “factual data”. Thus *grounds* are *specific* facts relied on to support a given claim.

Warrants: Knowing on what grounds a claim is founded is, however, only the first step towards getting clear about its solidity and reliability. Next we must check whether these

grounds really do provide genuine support for this particular claim. So the next set of questions is:

*Given that starting point, how do you justify the move from these grounds to that claim?
What road do you take to get from this starting point to that destination?*

The type of answers we may expect will depend on what kind of claim is under discussion. Steps from *grounds* to *claims* are “warranted” in different ways in law, science, in politics, and elsewhere. The resulting *warrants* take the form of laws of nature, legal principles, rules of thumb, engineering formulas, and so on.

Backing: Warrants themselves cannot be taken wholly on trust. Once we know what rule or law, formula or principle, is being relied on in any argument, the next set of questions can be raised:

Is this really a safe move to take? Does this route take us to the required destination securely and reliably? And what other general information do you have to back up your trust in this particular warrant?

The warrants relied on to authorize arguments in different fields of reasoning require correspondingly different kinds of backing. Aside from the *particular* facts that serve as grounds in any given argument, we therefore need to find out the *general* body of information, or *backing*, that is presupposed by the warrant appealed to in the argument.

Modal qualifiers: Not all arguments support their claims or conclusions with the same degree of certainty. Some warrants lead us to the required conclusion invariably; others do so frequently, but not with 100% reliability; others do so only conditionally, or with significant qualification -“usually”, “possibly”, “barring accidents”, and so on. So, the next set of questions is:

Just how reliable does this warrant lend weight to the given step from grounds to claim? Does it absolutely guarantee this step? Does it support it with qualifications? Or does it give us, at most, the basis for a more-or-less risky bet?

The degrees and kinds of strength with which warrants authorize us to argue vary greatly from one kind of case to another. Some lead to “probable” conclusions; others establish “presumptive” conclusions; and so on. Most practical reasoning is in fact concerned with what is “probably”, “presumably”, or “possibly” the case rather than with “certainties” alone.

Possible rebuttals: Unless we are faced by one of those rare arguments in which the central step from grounds to claim is presented as “certain” or “necessary”, we shall also need to know under what circumstances the present argument might let us down. Hence the final set of questions:

What kinds of factors or conditions could throw us off the road? What possibilities might upset this argument? And what assumptions are we implicitly relying on in trusting such a step?

Any except a certain or necessary argument is open to *rebuttal*. Such rebuttals may in some cases be very unlikely and hard to foresee, but we can understand the rational merits of the arguments in question fully only if we recognize under what circumstances (rare but possible) they might prove reliable. The *claims* involved in real-life arguments are, accordingly, *well founded* only if sufficient *grounds* of an appropriate and relevant kind can be offered in their support. These grounds must be connected to the claims by reliable, applicable *warrants*, which are capable in turn of being justified by appeal to sufficient backing of the relevant kind. The entire structure of argument put together out of these elements must be capable of being recognized as having this or that kind and degree of certainty or probability and as being dependent for its reliability on the absence

of certain particular extraordinary, exceptional, or otherwise *rebutting* circumstances. The *basic pattern of analysis* as presented by Toulmin *et al.* (1979) is then summed up in Figure 4.6 (previously 2.4).

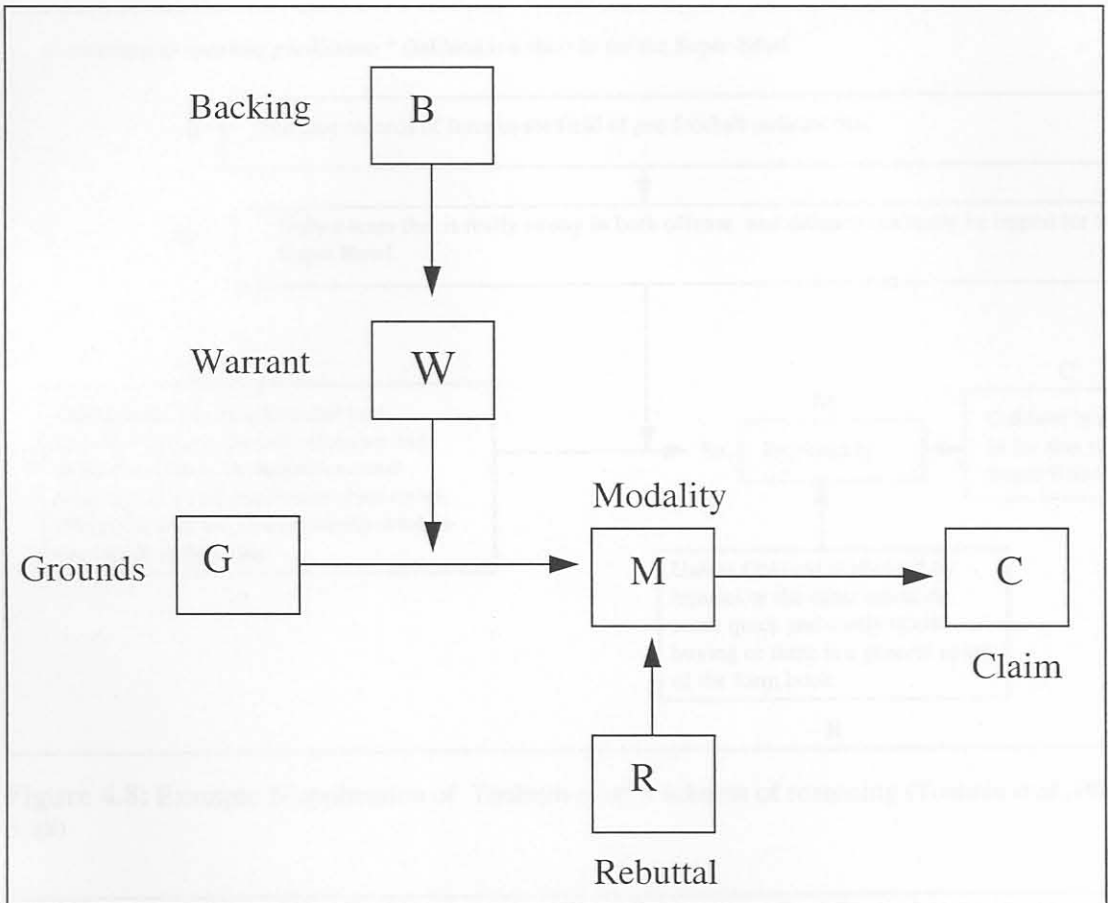


Figure 4.6 (previously 2.4): Logical Structure of Argument (Toulmin *et al.*, 1979, p. 78)

“ Given grounds, **G**, we may appeal to warrant, **W** (which rests on backing **B**), to justify the claim that **C** - or at any rate, the presumption (**M**) that **C** - in the absence of some specific rebuttal or disqualification (**R**). ”

We will henceforth refer to this Figure as Toulmin *et al.*'s *schema of reasoning*. In concluding this part of the chapter, we illustrate three examples showing how the schema is applied.

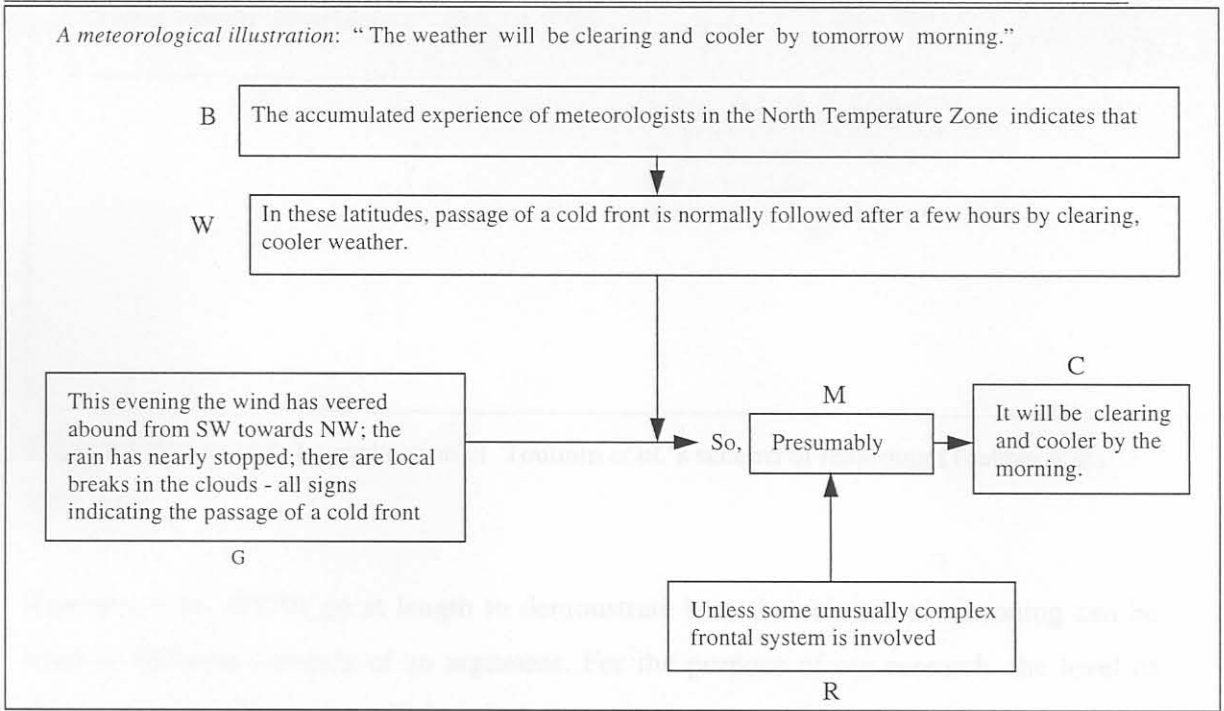


Figure 4.7: Example 1- application of Toulmin *et al.*'s schema of reasoning (Toulmin *et al.*, 1979, p. 87)

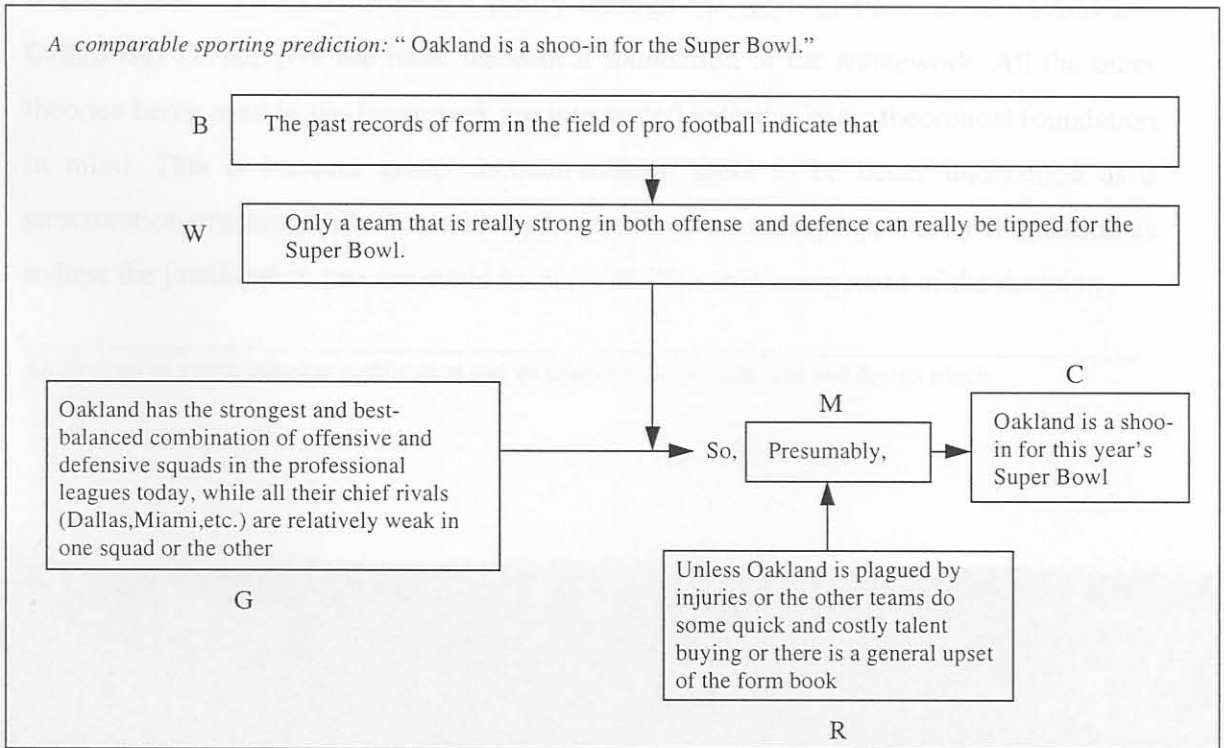


Figure 4.8: Example 2- application of Toulmin *et al.*'s schema of reasoning (Toulmin *et al.*,1979, p. 88)

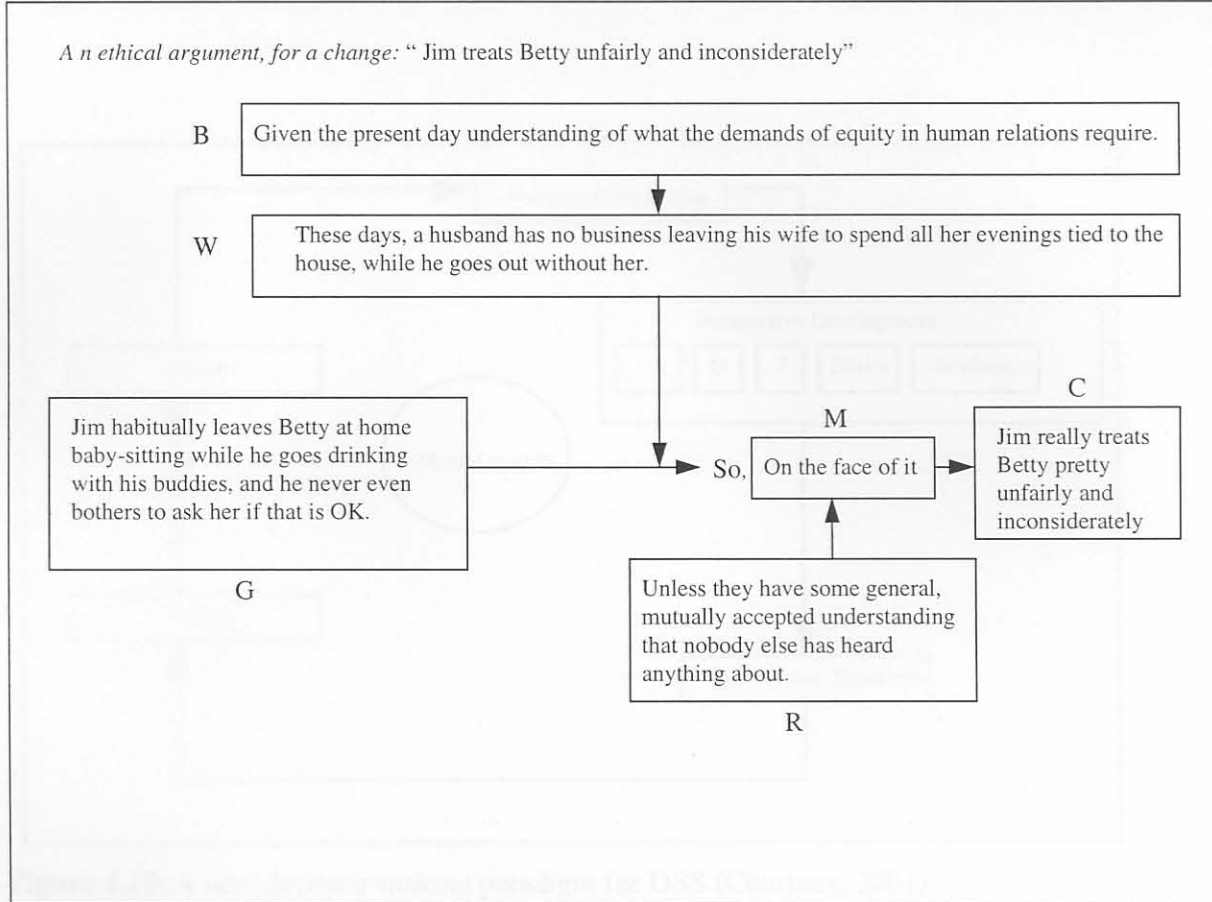


Figure 4.9: Example 3 - application of Toulmin *et al.*'s schema of reasoning (Toulmin *et al.*, 1979, p.88)

Toulmin *et al.* (1979) go at length to demonstrate how the schema of reasoning can be used in different contexts of an argument. For the purpose of our research, the level of detail presented above is sufficient in laying a foundation for our analysis. As indicated earlier already, Toulmin *et al.* (1979) schema of reasoning as presented here, together with Giddens' (1984) structuration theory through the work of Poole *et al.* (1985) and Orlikowski (1992) give the basic theoretical foundation of the framework. All the other theories being used in the framework are interpreted with this basic theoretical foundation in mind. This is because group decision-making seem to be better understood as a structuration process, while Toulmin *et al.* schema of reasoning lays a clear foundation as to how the justification process could be pursued. The next component of the decision

justification environment is the new decision-making paradigm proposed by Courtney (2001).

The new decision-making paradigm for decision support systems

We have presented an outline of the new decision-making paradigm for DSS as proposed by Courtney (2001) in chapter 2. We will concentrate here on how he used Mitroff and Linstone’s (1993) ideas of Unbounded Systems Thinking (UST) and the Singerian approach to develop the new decision-making paradigm for DSS; and how this new paradigm relates to the research framework and its application. The reader will recall Courtney’s framework, given in Figure 4.10 (previously labeled Figure 2.8) below.

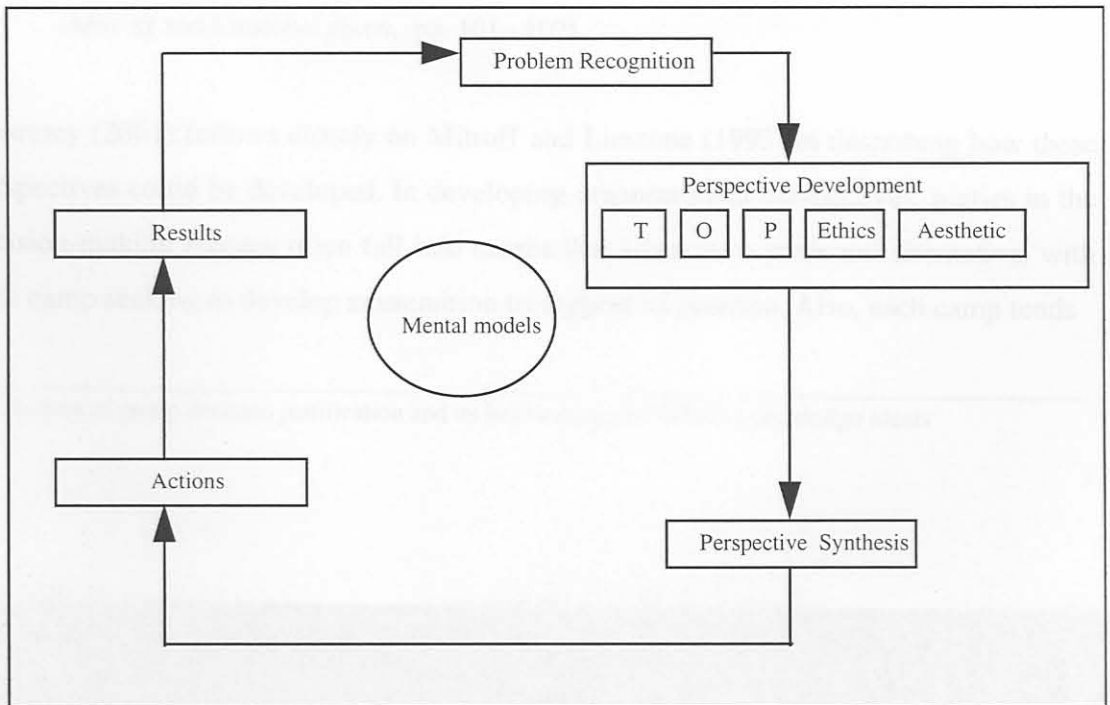


Figure 4.10: A new decision-making paradigm for DSS (Courtney, 2001)

The concept of multiple perspectives deriving from the Singerian approach and the UST underpin Courtney’s (2001) new decision-making paradigm for DSS. According to

Courtney, multiple perspectives are developed in several ways. First, the system “sweeps in” the other thinking styles (Leibnitzian, Lockean, Hegelian and Kantian) which means that it uses any or all of them where appropriate in decision-making processes, and may include any knowledge as needed from any discipline or profession to assist in understanding the problem. Courtney adopts Mitroff and Linstone’s (1993) reference to the four non-Singerian models as reflecting a technical perspective (T). They are all mechanistic and analytical in nature. They all have limitations, and in order to overcome these limitations, UST sweeps in what Mitroff and Linstone (1993, p. 99) call organisational and social (O), and personal and individual (P) perspectives. Quoting Mitroff and Linstone (*op cit.*), Courtney notes that these perspectives “bring to the forefront human beings collectively and individually in all their complexity.”

“... All complex problems - especially social ones - involve a multiplicity of actors, various scientific/technical disciplines, and various organisations and diverse individuals. In principle, each sees a problem differently and thus generates a distinct perspective on it.” (Mitroff and Linstone, p. 99)

Furthermore,

“In ‘real-life’ situations, managing problems consists of at least three activities: (a) analyzing alternatives, (b) making decisions about which alternative to choose, and (c) successfully implementing the chosen alternative. The T perspective focuses most strongly on (a) and least on (c); hence the “gap” so often deplored between analysis and action. Successful implementation depends first and foremost on the use of human resources and this means that O and P become crucial as we move from (a) to (c)”. (Mitroff and Linstone, *op.cit.*, pp. 101 - 102).

Courtney (2001) follows closely on Mitroff and Linstone (1993) in describing how these perspectives could be developed. In developing organisational perspectives, parties in the decision-making process often fall into camps that advocate a preferred alternative, with each camp seeking to develop ammunition to support its position. Also, each camp tends

to base its position on unstated assumptions which, if left uncovered, often lead to circular debate that gets nowhere (Courtney, 2001). Surfacing such assumptions is a critical part of developing organisational perspectives. Mitroff and Linstone (1993) suggest that assumptions can be surfaced by first identifying all stakeholders (anyone or group affected by the decision) and then simply asking each camp what they have to assume is 'true' of a particular stakeholder such that *starting from* that assumption that camp's preferred policy or actions would be supported. According to Courtney (2001), the personal perspective is perhaps not as well developed as the organisational. It is based on individual experiences, intuition, personality factors, and attitudes about risk, among other things. Courtney refer to individuals as notoriously complex and varied in their decision-making styles. In a complex scenario, given the same external information, no two people might reach the same conclusion, as their background, training, experience, values, ethics and mores may differ. Sweeping in as wide a variety of individual perspectives as feasible is thus necessary for unstructured decisions.

Two other factors which "makes us human" (Courtney, 2001), have been neglected, but he sweeps them in through the multiple perspective approach. These are ethics and aesthetics in decision-making. He indicates that Churchman (1971) and many others have long called for much greater consideration of these factors in both our business and personal lives.

According to Courtney, UST and multiple perspectives approach bring many new factors into the picture for organisational knowledge management and decision-making. He posits that one might even consider this (his new decision-making paradigm for DSS, Figure 2.8) to be an alternative decision-making paradigm, or at least a major overhaul of the conventional DSS view of decision-making, which scarcely considers anything but the technical perspective. At the heart of the process is a *mental model*. Courtney say that actually, this could be several mental models, or a collective model of some sort. This model, according to Courtney (using Churchman; Mitroff and Linstone; *op cit.*), and the

data collected by it (and hence the problem selected for solution) are strongly inseparable. Courtney go on to say the following about the mental model:

“Our mental model, either personally or collectively, determines what data and what perspectives we examine in a world of overabundant data sources and a plethora of ways of viewing that data. The mental models influence and are influenced by every step of the process. That is, the models determine what is examined and what perspectives are developed. As perspectives are developed, insight is gained, and the mental models are updated. That is, learning takes place. Tacit knowledge is created.” (Courtney, 2001).

The decision process begins with the recognition that a problem exists; that is, a decision needs to be made. But rather than jumping simply into analysis (the technical perspective), the process consists of developing multiple perspectives of the various kinds described above. According to Courtney, the various perspectives provide much greater insight into the nature of the problem and its possible solutions than the heavy reliance on the technical perspective that DSS has advocated in the past. He suggests that diagramming tools such as cognitive maps, influence diagrams, entity-relationship diagrams and object diagrams as expressed for example by the Unified Modelling Language may be of great use both in showing the connectedness of elements in wicked systems, and in surfacing assumptions that people hold about wicked problems. He also highlights that it has been shown (Massey and Wallace, 1996) that having groups draw cognitive maps leads to surfacing of differences about variables and relationships in a problem and more effective communication during the decision-making process.

Courtney, using the work of Mitroff and Linstone suggest some guidelines for applying the multiple perspective approach to organisational environments conducive to the use of the Singerian, multiple perspective approach. The guidelines are the following:

1. Strike for a balance among technical, organisational and personal perspectives.
2. Use “good” judgment in selecting perspectives. Foster a dialectic among those holding various perspectives and draw out the most plausible elements of each.
3. In obtaining information, recognize that organisational and personal perspectives require greatly different methods than the technical. One-on-one interviews are the best source of information, but the interviewers must be good listeners and sensitive to nuances and nonverbal communication.
4. Pay attention to the mutual impact, interdependencies, and intergration of perspectives. “We cannot reiterate enough that we are dealing with UST. There is no formula or pat procedure to assure or guarantee that all interactions are taken into account.” (Mitroff and Linstone, 1993, p. 108). Yet, this is a critical point, and the decision-maker must be careful to conceive of as many interactions as possible.
5. Beware of thinking statistically in dynamic environments. With the advent of globalization, the internet and electronic commerce, business environments change rapidly. Decision-makers must stay abreast of changing situations.

Next, we discuss how the new decision-making paradigm for DSS relate to the research framework, its implications and how it will be used.

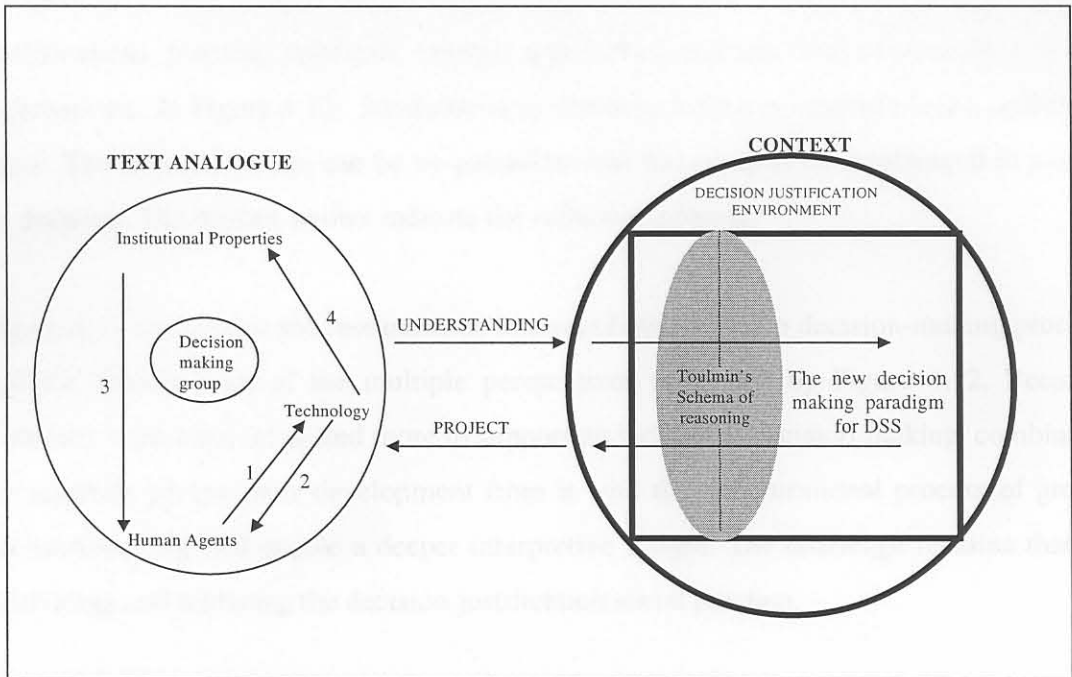


Figure 4.11: Group decision-making and the new decision-making paradigm for DSS.

The research framework and how it relates to the new decision-making paradigm for DSS

We will use Figures 4.10 and 4.11 as our reference diagrams. Unlike Toulmin *et al.*'s schema of reasoning, the new decision-making paradigm for DSS is placed under the decision justification environment for a different reason. We would like to understand how the paradigm could be applied within a group decision justification context.

Because we already know from our day-to-day lives and the literature that not all decisions need to be justified, we must start with an assumption that the decision-making group recognizes and value the *decision justification social practice*. So when the logics of Figure 4.10 outlining the new decision-making paradigm are unfolded, the decision-making group is at the same time preparing itself for a decision justification process. Consistent with UST, Toulmin *et al.*'s schema of reasoning is "swept in" in order to guide

the justification process. The sweeping in of Toulmin *et al.*'s schema of reasoning cannot be without implications on the new decision-making paradigm. Our view is that both the *mental models* of group members and the way in which they develop their *multiple perspectives* on the decision task would be affected in one way or another. This means that decision justification as a concept will become one of the perspectives, in addition to the T, O, P, Ethics and Aesthetics in Courtney's paradigm; while a particular way of thinking (let us call it an *Informing Pattern and Way of Thinking*) become one of the mental models of all group members. These implications can be summarized in Figure 4.12. The *Informing Pattern and Way of Thinking* emanates from the decision justification social practice and will be based on constitutive meanings each group member brings to the decision-making process. An example here could be the components of the schema of reasoning, Claims, Grounds, Warrants, Backings, Modal qualifications, possible Rebuttals; together with values, culture, level of training of group members etc. In Figure 4.12, justification is shown as both a *perspective* and a *reflection stage*. The reflection stage can be by-passed in case the group is not challenged to justify its decision. The broken arrows indicate the reflection process.

Figure 4.11 will enable the researcher to interpret both the group decision-making process and the development of the multiple perspectives suggested by Figure 4.12. Because Courtney's paradigm is geared more to supporting individual decision-making, combining the multiple perspectives development from it with the structural process of group decision-making will enable a deeper interpretive insight. The challenge remains that of cultivating and nurturing the decision justification social practice.

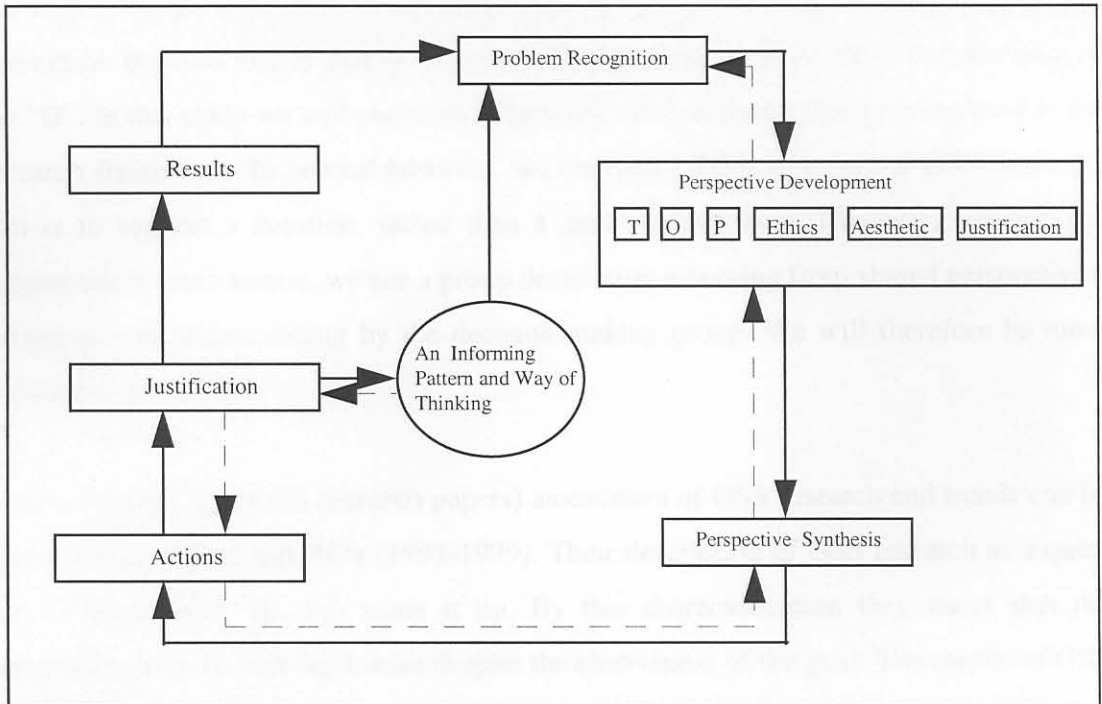


Figure 4.12: Implications for the decision justification social practice on the new decision-making paradigm for DSS (adapted from Courtney, 2001)

4.2.3 GSS research - trends and historical developments

Most of the recent literature does not distinguish between Group Decision Support Systems (GDSS) and Group Support Systems (GSS). DeVreede *et al.* (2000) point out that in the beginning, GSS were called GDSS and that the “D” was later dropped because in practice it turned out that these systems did not only support group decision-making, but also more general meeting processes focused on exchanging information and developing joint insight. This explanation partly addresses an issue which was raised by Walsham (2001, p. 109):

“... There is a certain irony that this group decision support system (GDSS) seemed poorly suited to facilitating decision-making, but rather better suited to group discussion. Perhaps the term GDSS should stand for group discussion support system?...”

Here Walsham (2001) was making an interpretation of a World Bank study conducted by Bikson (1996). Bikson was reporting the results of his study using GroupSystems, a software system designed to support same-time same-place interactions among many-person groups. He reported and argued that the software well supported divergent thinking - the generation of ideas, alternatives, plans, explanations, proposals. In contrast, convergent cognitive tasks - making decisions, resolving conflict, allocating scarce resources were less well supported.

This is just a snapshot of typical results that are often reported in GSS research. There are as many of them as there are researchers. The point we are making here is to clarify the distinction between GDSS and GSS and the kinds of arguments behind the dropping of the “D”. In this study we will use both, depending on a particular theory being used in the research framework. In general however, we consider GDSS as a special GSS when the aim is to support a decision, rather than a general discussion. However, because our framework is hermeneutic, we see a group decision as emerging from shared perspectives, meanings and understanding by the decision-making group. We will therefore be more inclined to use GSS.

A very detailed (230 GSS research papers) assessment of GSS research and trends can be found in Fjermestad and Hiltz (1998-1999). Their description of GSS research as a quest for a “Holy Grail” (p. 56) sums it up. By this characterization they mean that the undertaking remain very legitimate despite the elusiveness of the goal. The results of GSS remains contradictory, inconsistent and inconclusive. This, according to De Vreede *et al.* (2000), is despite the fact that already in the 1970s, the first GSS prototype was tested (Wagner *et al.*, 1993). Gopal and Prasad (2000) explored the GSS scholarship and emphasised a point which we share, together with others (Chin *et al.*, 1997; DeSanctis, 1993; Briggs *et al.*, 2001; Phahlamohlaka and Roode, 2001), that there has been too much focus on the technology itself, rather than on human interaction. DeSanctis and Poole (1994) point out that the assumption that a GDSS can have effects on its users and the

outcome of its use independently of the manner and context of its use is excessively technology-centered and inappropriate. We share the view that GDSS technology is social in nature and that the outcomes of its use vary with the context of its use by different groups.

Gopal and Prasad (2000) argue that the inherently social nature of GDSS use points to a rich contextuality and the virtual impossibility of being able to reproduce in “real” GDSS meetings the specific conditions or outcomes that obtain in our research settings. They go on to point out that the variables and models we specify begin to stand opposed to the models created or adopted by other researchers as means of understanding GDSS use, resulting in fragmentation when what we seek is consistency. They make a very valid statement which was also differently and independently made by Phahlamohlaka and Roode (2001):

“Just as researchers bring with them alternative ways of characterizing GDSS use, those who use GDSS bring to it a variety of ways of understanding it, so that when a particular research model explains how a particular group experienced a GDSS, the way in which they actually experience it might have little to do with the researchers’ explanation.” (Gopal and Prasad, 2000).

The technocentrism is according to Gopal and Prasad very prevalent. Even as we recognize increasingly that technology cannot be studied outside its social context and that inconsistent results may be directly related to our lack of attention to this fact, we continue to study the effects of the technology while treating the context as just another variable rather than as something intrinsic to the technology. This brings us back to the quest of a Holy Grail of Fjermastan and Hiltz. As Jones (1994, p. 26) points out, “the ‘system’ that supports group decision-making needs to be viewed more widely than simply the technology and should include appropriate elements of the social context”. For our purposes then, such a context is what we propose as the *decision justification social practice*.

Another potential reason for inconsistent results in GSS is the idea of a *meeting*. Gopal and Prasad quote Dennis *et al.* (1990-91) who note that “studies should focus not only on the meeting session as a unit of analysis, but also on the project as a unit of analysis, where a project may consist of a number of meetings” (p. 128). They indicate that unfortunately, even in recognizing the importance of the context of the meeting, studies appear to suggest that the context can be defined merely as other meetings. Gopal and Prasad also quote DeSanctis *et al.* (1993) who they say are more suggestive of the relationship between the concern with the meeting as the unit of analysis and inconsistent results when they say that “observation of ... team interactions outside the meeting room might lead to different conclusions” (p. 27).

Gopal and Prasad (2000) cautiously proceed from this background to make a claim that rather than the use of the prevalent mode of research to further our understanding of GDSS and run the risk of exacerbating the problem of inconsistency and fragmentation, it might be more useful at this stage to explore alternative epistemological approaches in the hope that these might be more helpful to us to get beyond these problems and look at the GDSS phenomenon from entirely different viewpoints. They then propose that the use of methodologies rooted in sociological paradigms employing field methods of thick description are likely to offer the kinds of rich and strongly-textured views of GDSS that we need to more fully appreciate how they are used. They conclude by proposing symbolic interaction as a methodology for studying group technologies, and continue to show the results of their work from using the methodology to study GDSS use by teachers in a western Canadian school. We will return to some of their observations, arguments and suggestions and relate them to our research framework later in this chapter.

Arguing along similar lines, Briggs *et al.* (2001) propose a GSS research approach that is based on the notion of *thinkLets*. According to Briggs *et al.* (2001), one cause of the conflict and ambiguity in GSS research results may be the result of focusing on what they say is a *less-than-useful level of abstraction*: GSS itself. They argue that in GSS research,

the thinkLet may be a more useful unit of comparison than the GSS. A thinkLet, according to the authors, encapsulates three components of a GSS stimulus: *The tool, its configuration, and the script*. They report on having documented about 60 thinkLets that map to seven basic patterns of thinking: Diverge, Converge, Organize, Elaborate, Abstract, Evaluate, and Build Consensus. Each thinkLet creates some unique variation on its basic pattern.

By focusing research on thinkLets, rather than GSS, they predict that field and laboratory research may be more controllable, more replicable, and better able to inform GSS development and use. They note that their field experience shows that thinkLets may be used to create repeatable, predictable patterns of thinking among people making an effort toward a goal.

The theoretical ideas behind the use of both symbolic interaction and thinkLets in GSS research have partly informed the construction of our research framework. Our aim in including them as part of the decision justification environment is to enable us not only to use them to analyse the empirical data, but also to investigate the extent to which a contribution could be made to their further enhancement and development, through combining them with other theories within the framework. We next focus on thinkLets, the main ideas behind them and how they relate to the research framework.

ThinkLets - towards a new research approach for GSS

It is our view that the notion of thinkLets relates closely to Toulmin *et al.*'s schema of reasoning as presented earlier. It seems possible that through the relationship between thinkLets and Toulmin *et al.*'s schema, one could better analyse how GSS could be used to support decision-making groups when justification of such decisions become necessary. Because of our belief that this thinkLets notion could be a more viable option for conducting GSS research, we present below the main ideas behind it. We then attempt

to draw some comparisons with Toulmin *et al.*'s schema of reasoning in order to investigate how this comparison could inform GSS use and design. Our reference diagram here is Figure 4.13.

Main ideas behind thinkLets

Like Gopal and Prasad (2000), Briggs *et al.* (2001) also start by making reference to the work of Fjermestad and Hiltz (1998-99), of inconclusive results on GSS research. According to Briggs *et al.*, conflicting results in GSS research mean that it is difficult for GSS research to inform GSS practice. GSS practitioners must look to research for guidelines on system design and implementation, collaborative processes and methodologies, etc. They argue that it is not sufficient for researchers to declare that GSS seems to lead to higher productivity, indicating that researchers have a real responsibility to make it clear how to transfer experiences from the research arena into the organisational arena.

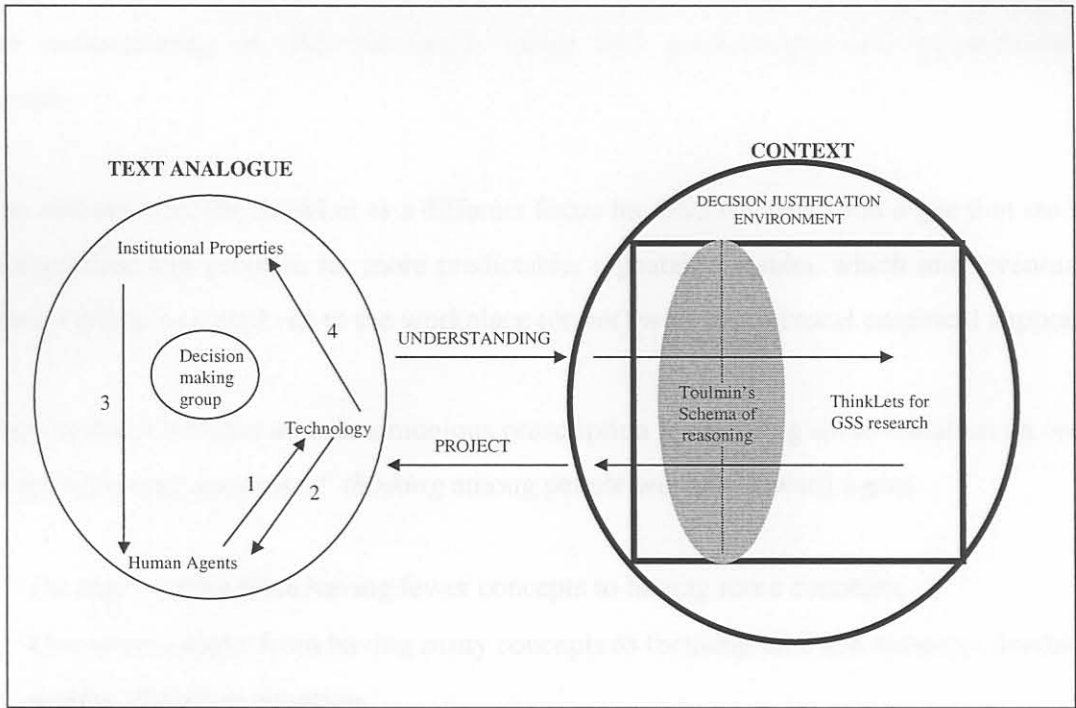


Figure 4.13: Group decision-making and thinkLets for GSS

They then argue that *thinkLets* may serve to facilitate that transfer, and stimulate the heretofore relatively slow transition of GSS from academia to the workplace. Although the tone of Briggs *et al.*, is similar to that of Gopal and Prasad in the sense that they both advocate for a shift in focus from the technology to human interaction, they seem to retain most of the quest for a “Holly Grail” (Fjermestad and Hiltz, 1998-99) as reflected in the following statement:

“... conflicting results may also cast a pall over the academic rigor and reputation of the GSS research community. Finding a way to resolve these conflicts and to produce predictable, repeatable results could do much to stimulate GSS research, and redeem the reputation of the GSS research community.” (Briggs *et al.*, 2001).

This may explain why Gopal and Prasad were cautious about the epistemological shift, despite their very well argued position which we share. Clearly, Briggs *et al.*, still believe

in the search for consistency of GSS research results, an idea which Gopal and Prasad suggest is no longer viable. We too do not necessarily buy into Briggs *et al.*'s quest for predictable and repeatable results. The reason we are pursuing Briggs *et al.*'s notion of thinkLets here is because they are in the process of developing this new concept from a practical point of view, with a focus on the thinking patterns of groups during decision-making. It is the emphasis on this pattern of thinking that is of interest to us, and not so much the predictability and repeatability of results themselves. Toulmin *et al.*'s schema of reasoning, upon which our analysis framework is based, is a thinking pattern aimed at guiding any form of argument, and for our purposes, the justification of claims which may be the bases for group decisions. There are therefore some virtues in the research pursuit along the notion of thinkLets, although for us it is the potential of the notion to enhance our understanding of GSS transcripts, rather than predictability and repeatability of results.

The authors offer the thinkLet as a different focus for GSS research, and argue that studies of thinkLets will produce far more predictable, repeatable results, which may eventually allow GSS to be rolled out to the workplace (or not) with unequivocal empirical support.

They define a *thinkLet* as a parsimonious prescription for creating some variation on one of the following *patterns of thinking* among people working toward a goal:

- *Diverge* – move from having fewer concepts to having more concepts.
- *Converge* – move from having many concepts to focusing on a few concepts deemed worthy of further attention.
- *Organize* – move from less understanding to more understanding of the relationships among concepts.
- *Elaborate* – move from having concepts expressed in less detail to having concepts expressed in more detail.
-

- *Abstract* – move from having concepts expressed in more detail to having concepts expressed in less detail.
- *Evaluate* – move from less understanding of the value of concepts for achieving a goal to more understanding of the value of concepts for achieving a goal.
- *Build Consensus* - Move from having less agreement among stakeholders to having more agreement among stakeholders.

A thinkLet has three components:

Tool – *The specific version of the specific hardware and software technology used to create a pattern of thinking.*

Configuration – *The specifics of how the hardware and software were configured to create a pattern of interaction.*

Script – *The sequence of events and instructions given to the group to create the pattern of thinking.*

According to the authors, these three components taken together constitute the stimulus that causes the pattern of thinking reported in a GSS research paper. They argue that lacking knowledge of any one of these components, others cannot recreate the stimulus, and so may not be able to reliably recreate the thinking pattern achieved with a GSS. Lacking knowledge of any one of these, they argue - a practitioner cannot recreate the stimulus used to produce an effect reported in a research paper. “That each component has an effect on outcomes with GSS can be inferred from the rich body of published GSS literature;” they claim.

The authors proceed to discuss each of the components, and amongst others present the following descriptions:

Tool

- Any given GSS is not a single tool, but a collection of tools that differ widely from one another. One could not expect to obtain the same results with an electronic brainstorming tool as one obtains with a group outline or an electronic voting tool. Therefore, without knowing which tool a group used, one cannot reproduce the group's results.
- Further, GSS's are not a single system, but a category of systems, and the systems in that category differ widely. For example, the electronic brainstorming tool in some systems might require that all users contribute ideas to the same electronic page, while the electronic brainstorming tool in another system might require that all participants contribute to different pages, and that they swap the pages among themselves.

Thus, one must conclude that differences in technology can produce differences in outcome, and one must know the exact tool that was used in order to reproduce the results of others. However, just knowing which tool was used is not sufficient to assure replication of results.

Configuration

- Some GSS tools have many possible configurations, and different configurations may have different effects on group outcomes. The GroupSystems Electronic Brainstorming tool, for example, has more than 20 independently configurable features, for a total of 1,048,576 possible combinations. Those features are configurable precisely to allow teams to change their patterns of thinking and interaction.
- In order to understand how a group achieved its results, one must know exactly which tool was used, and exactly how that tool was configured. However, knowing both the tool and its configuration is still not sufficient if the goal is to create a repeatable, predictable pattern of thinking and interaction among the members of a team.

Script

- The very same GSS tool configured in the very same way can produce very different patterns of thought, depending on the script in which it is embedded. A script is the sequence of events and prompts given to a group as they use a GSS tool.
- Shepherd, et al. [1995] used a set of tightly scripted treatments to assess the effects of social comparison on brainstorming productivity. However, in one treatment, one of the three facilitators on the project changed just two phrases in a 10-page script. Instead of saying, “performing above average,” he said, “kicking butt.” Instead of saying, “performing below average” he said “brain dead.” This slight variation produced laughter among the subjects, which raised the salience of the social comparison, which caused a double-digit improvement in their brainstorming productivity. When the researchers discovered the script anomaly, the facilitators reversed roles. All facilitators were able to produce double-digit improvements by assuming a jocular tone when making the social comparison to the group.
- Connolly, Jessup, and Valacich [1990] demonstrated that using a script with a critical evaluative tone caused anonymous GSS users to produce more ideas of higher quality than did those using a script with a positive evaluative tone.

Thus, by knowing the *tool*, the *configuration*, and the *script*, one may be able to recreate the stimulus used by others to produce a pattern of thinking. Lacking knowledge of any one of these components, it may not be possible to reproduce results achieved by others with a GSS. The tool, the configuration, and the script constitute the *thinkLet*.

ThinkLets as a Pattern Language

The authors cite their field experience as suggesting that thinkLets tend to create repeatable patterns of thought among people working toward a goal, and because thinkLets have names, and because the components of a thinkLet may be communicated,

thinkLets may serve as a useful pattern language for reasoning toward a goal. This is where the relationship between *thinkLets* and Toulmin *et al*'s schema of reasoning lies; the useful pattern language for reasoning. One can think of the basic pattern of analysis as a *decision justification script* consisting of a claim, grounds, warrants, backings, modal qualifiers, and possible rebuttals. By prescribing the components of this script within a justification social practice, one could be able to recreate the stimulus used by others to produce a pattern of thought among people working towards a goal.

A key consideration for our purposes however, is not the repeatability of *results* by the researcher, but rather the repeatability of the *process* by the group itself. The group should only be able to explain to itself and others the process it has followed in arriving at its decision. Of course, in case a particular tool was used, it too and its configuration may have to be explained.

The authors use the following examples to demonstrate the importance of a script, with the tool and its configuration kept constant:

Consider, for example, Free Brainstorming and Comparative Brainstorming, two *thinkLets* that use the same tool and configuration, but different scripts to produce different patterns of divergence. Both *thinkLets* use the GroupSystems Electronic Brainstorming tool in its default configuration, which provides a separate electronic comment page for each participant. Participants may contribute one idea to a page, then they must send the page back to the group. The system randomly brings back a different page that contains ideas contributed by others. Each page gradually accretes a conversation as it moves from person to person.

With Free Brainstorming the participants are told:

The system will bring you a new page with ideas contributed by somebody else. You may respond to the ideas of others in one of three ways:

- *You may argue with them*
- *You may elaborate on them by adding detail*
- *You may ignore them and contribute a completely new idea.*
- *As soon as you finish one idea, you will send the page back to the group and get a different page back. The goal is to produce as many different ideas as we can in a short time.*

They note that people respond to this thinkLet by moving quickly to the boundaries of their problem space and producing a number of creative ideas, but the conversation also tends to be filled with noise and digression. The group must then use another thinkLet to sift the gold nuggets from the sand.

With Comparative Brainstorming, the participants know in advance the criteria for judging the quality of a good idea. For example, in a competitive manufacturing setting, good solutions might be those that are more efficient, higher quality, and build customer loyalty. These criteria become prompts in the script, which run something like this:

Each of you has a different electronic page in front of you. Everybody please enter the single best solution that occurs to you, then cross your arms and wait for your next instruction.

Now swap pages. You should see a page with one idea on it contributed by somebody else.

Give me a new solution that will be more likely to cut costs than the idea in front of you.

Now swap pages again.

Give me a new solution that is likely to result in better customer relationships than either of the two you now see on the screen.

Now swap pages.

Give me a solution that is more likely to shorten our production cycles than any of the ideas you see...

According to Briggs *et al.*, people respond to this thinkLet by producing fewer solutions that conform to the known criteria for idea quality. They do not tend to explore the boundaries of their problem space, but they arrive at high quality solutions very quickly, and there is very little noise or digression. Thus, when time is of the essence and the criteria for a good outcome are known, one might choose Comparative Brainstorming, but when creativity is more important than speed, one might choose Free Brainstorming. Each of these two thinkLets creates its own variation of the divergence pattern; each has its own personality.

A third example they use is a thinkLet called Point-Counterpoint which also uses yet another script based on the same tool and configuration to create a consensus-building pattern instead of a divergence pattern. The claim they make is that this thinkLet can be used to help break an impasse in a badly conflicted or polarized group. We identify this thinkLet as being based on the Hegelian mode of inquiry. It runs something like this:

Each of you has a different electronic page in front of you. Everybody please enter your single strongest argument in favor of your position, then cross your arms and wait for your next instruction.

Now swap pages. You should see a page on the screen with an argument contributed by some other person.

Whatever the argument you see on your screen, demolish it. Make as strong an argument against it as you can, whether you agree with it or not.

Now swap pages. You should now see two arguments on the screen: one that argues very strongly in favor of some position, and a mutually exclusive argument that counters the first. Your task is to write an argument that bridges those two mutually exclusive positions.

Now swap pages. Let's talk about what you see on your screens.

The observation they make here is that when people participate in a Point-Counterpoint, their initial arguments are diverse, starting from many different premises. Likewise, the counter arguments also tend to be diverse. However, when they begin to grapple with bridging arguments, it is not uncommon for many participants to find the same bridging argument.

The mechanics of the three preceding thinkLets are similar, but the pattern of thinking produced by each is unique. When one becomes familiar with thinkLets and their effects on thinking patterns, one can speak of large, subtle, and powerful GSS process design issues using very few words.

Reflections on ThinkLets

In reflecting on thinkLets, the authors acknowledge that although the thinkLet as an identifiable concept is fairly new to the GSS research community, the thinkLets themselves have been around for a long time as tacit knowledge in the minds of GSS researchers and facilitators. They indicate that, all of the GSS facilitators whom they have interviewed have had a dozen or so favoured thinkLets in their repertoires - reliable ways to create predictable patterns in the groups with which they work. Sometimes they had names for their thinkLets, other times they simply executed them without explaining them, even to themselves. With questions like,

What do you do when you've got a group that's badly polarized, and they just can't move forward?

What do you do when you want to encourage people to break out of old thinking ruts to find new ideas?

the authors report that they have elicited thinkLets from facilitators. They posit that by formalizing the thinkLets concept, and by naming and documenting the thinkLets, the GSS research community may be able to:

- Create a common pool of useful thinkLets from what are now isolated puddles of valuable intellectual capital.
- Theorize about the underlying propositions of cause-and-effect that play out during goal attainment in an effort to explain why the known thinkLets work as they do.
- Provide a solid basis for analysis and comparison of field and laboratory studies of GSS research. Field studies become far more controllable if their GSS interventions are scripted and documented, and if measures are taken to determine whether the expected patterns of thinking do, in fact, emerge in GSS intervention. Laboratory studies become far more replicable when all components of the thinkLet stimulus are controlled and reported.
- Design new, more efficient and effective thinkLets based on theoretical foundations and empirical results of thinkLet-based studies.
- Produce new technologies even better suited to creating, sustaining, and then changing patterns of thinking among people working toward a goal.

With a GSS, a beginner can learn all there is to know about how to make things happen on the screen, and still have no idea about how to use the GSS to move people toward a goal. By focusing beginners on patterns of thinking from the outset, they appear to have a better grasp of the possibilities a GSS presents. They can create useful patterns of thought without having to learn more than is necessary about the details of the technology.

ThinkLets as a cornerstone for repeatable methodologies

In concluding their study, the authors point out that a thinkLet isn't a methodology. It is a way to create a pattern of thinking; a methodology is a step-by-step way to accomplish a mission critical task like strategic planning or requirements negotiation. They indicate that in the end, a thinkLet only matters if it can make a difference on some important task. They caution that just because they can predictably create a pattern of thinking doesn't mean they can create a successful methodology. According to them, much work remains to be done to learn how thinkLets can be combined to create predictable, repeatable success on mission critical tasks. They quote Ashby's (1956) law of Requisite Variety and say that thinkLets may be thought of as a control system for patterns of reasoning, while a methodology may be considered a control system for accomplishing a mission critical task.

An important limitation pointed out is that although a thinkLet may create a predictable thinking pattern, the user of a thinkLet must assure that the pattern it creates will, in fact, be useful for the task at hand. A divergence thinkLet may block the success of people who need and want to converge.

Conclusions and call to action on thinkLet research

The authors note that because a thinkLet encapsulates the components of a stimulus used to create a single repeatable, predictable pattern of thinking among people working toward a goal, in GSS research, the thinkLet may be a more useful unit of comparison

than the GSS. By focusing on thinkLets instead of technologies, GSS researchers may be able to produce more replicable results, and may be able to broaden the scope of GSS research beyond its current focus on divergence, to embrace convergence, organisation, elaboration, and so on. A focus on the thinkLet, rather than on the GSS technology may lead eventually to a fundamental shift in the structure and purpose of the GSS. A GSS is commonly perceived as a collection of useful software tools for groups making a concerted effort. They report that no existing GSS yet supports directly the capture and delivery of all three components of a thinkLet for the purpose of creating a repeatable pattern of thinking. They conclude that because thinkLets demonstrably create repeatable patterns of thinking, they may provide a window to the cognitive, social, and other mechanisms that come into play as people work toward their goals.

As a call to action by the GSS research community, the authors say that many existing thinkLets are still embedded in the tacit knowledge of expert GSS users, and as such are unavailable to the GSS community. They point out that much work lies ahead to retrieve, document, and publish these thinkLets so they may become part of the GSS research and practice canon. They note further that today's thinkLets are parsimonious prescriptions, derived and tested in the field, indicating that to date, little theoretically rigorous study of the cognitive, social, political, and other principles underlying thinkLets has been done. According to them, much research must still be done to explain why these prescriptions work as they do. The authors say that many of the classic GSS research papers do not report procedures in sufficient detail to allow a reader to infer the thinkLet that gave rise to the effects, and as such much of that research should now be revisited and replicated with clearly scripted thinkLets, so we may learn what it is we should have learned from those ground-breaking studies. It is noted that the seven basic thinking patterns have all been defined in terms of movement and change – from fewer ideas to more ideas; from less detail to greater detail; from less agreement to more agreement, and so on, and that this framing of the categories points the way for empirical measures of thinkLet efficacy. According to the authors, if a thinkLet is to cause convergence, one can measure the

degree to which and the speed with which people were able to focus their attention on ideas worthy of further attention. If a thinkLet is to cause the building of consensus, one can use coefficients of concordance to measure the degree of consensus in a group. Their final call to action is that by focusing on measuring the kind of movement change a thinkLet is meant to induce, researchers can grapple with some important constructs that may have previously been hard to pin down.

On using the thinkLet concept within the research framework

Perhaps the best way to explain our thinking about how the thinkLet concept would be used in the framework is to construct an illustration. Our reference diagram in this regard is Figure 4.13 below. Our starting point is a *decision justification social practice* as described earlier. Group members starting a group decision-making process informed by the decision justification social practice would commence their task knowing and accepting that they will have to justify their decision to themselves and others.

A group decision justification thinkLet informed by Toulmin *et al.*'s schema of reasoning would then be constructed. Such a thinkLet could have a *script* containing all the elements of the basic pattern of analysis. A tool to be used to support this effort would be configured, and the group would be taken through a particular kind of training (outlined in the next chapter) aimed at enabling them to be aware of both the constraining and the enabling nature of the tool and its configuration. The decision-making process would then proceed hermeneutically, with multiple perspectives generated and interpreted as in Figures 4.3 and 4.13. The structurational processes presented by Poole *et al.* and Orlikowski would be used by the researcher as interpretive lenses. The results of the hermeneutic process by the group itself would be recorded in a format consistent with Toulmin *et al.*'s schema of reasoning, thus enabling the group to identify their decision making patterns and therefore the argumentative logics of their final decision.

Clearly, the notion of a script in a thinkLet would be helpful for our purposes. The concept of a thinkLet addresses key design aspects of GSS research which are very relevant to our study.

Focus on symbolic interaction - the interpretive approach for GSS research

We have introduced the basic ideas behind symbolic interaction in chapter 3 and gave the reason for its inclusion into the research framework. The question we are attempting to respond to here is in what way do these ideas assist us in pursuing our research purpose and goal. Because symbolic interaction is a long standing methodological tradition, let us first discuss its methodological principles before attempting the above question. Gopal and Prasad (2000) describe the principles as follows:

“Symbolic interaction is part of the intellectual tradition best characterized as interpretivism. While sharing many of the influence and features of phenomenology, social construction, and dramatism, symbolic interaction is nevertheless a unique approach in its own right. It is rooted in the social constructionist position that views all social interaction as following from the meanings assigned by individuals and groups to objects and events in the course of everyday life and practice. It is based on the premise that human society is characterized by the use of symbols and meanings, and that the meanings of various social and non-social objects or symbols are derived through the interaction process. To a symbolic interactionist, any technology, including GDSS, acquires a certain symbolic reality only through the interpretations made by a number of people including designers, managers, facilitators, and various end-users. Symbolic interactionists recognize that people may symbolically sustain certain notions such as freedom, justice and leadership at a broad societal level, but that those notions contain very different images and meanings for people within particular institutional contexts.” (Gopal and Prasad, 2000)

According to these authors, there are four key aspects underpinning symbolic interaction:

Roles - which are socially defined expectations of behaviour from individuals in particular social positions. These roles also provide individuals with a complex set of identities, which become the source for individual interpretations of social situations. Thus one's identity as an IS expert or as a school teacher will strongly influence one's interpretation of any circumstance, action or object.

Enactment - which refers to the process whereby symbolism in organisations shapes and influences everyday action by different organisation members. Thus, meanings attached to objects such as computers or GDSS exert considerable influence on how these technologies are received and used in any organisation.

"Self" and "Identity" - retained as ontological attachment which serve as a fundamental source of all sense making and interpretation. This means that research in this tradition looks for multiple rather than shares realities. From a symbolic interactionist standpoint, these multiple realities might be fragmented and even contradictory, but nevertheless form an integral part of the research account.

Dynamic and Emergent nature of social meanings - meaning and action are inextricably intertwined, each producing and being produced by the other. The term symbolic interaction itself refers to this inseparable connection between meaning and action.

Table 4.3: Criteria used to evaluate symbolic interactionist research (Gopal and Prasad, 2000)

Research stage	Guiding Principle	Description of Principle
Research design	Compatibility of research questions with symbolic interactionist assumptions and orientations	Questions need to focus primarily on the symbolic and emergent aspects of phenomena being studied with emphasis on multiplicity of meaning and the role of self and identity in mediating local interpretations
	Selection of appropriate field setting and methods	Research conducted only in a naturalistic field setting that permits researcher access to multiple standpoints in the situation. Choice of methods that permit access to everyday lifeworlds and experiences.
Data collection	Immersion	Depth of researcher involvement either through lengthy observational periods or through intense contact with subjects and situation
	Capture of multiple realities	Gathering viewpoints and interpretations that are shared, divergent, and even contradictory
	Familiarity with context(s)	Understanding the relevance of different contexts (organisational, professional, etc.) that are symbolic parts of the situation being studied.
Research description	Thick description	Presenting the connotational significance of the findings
	Maintaining narrative rather than scientific style	Telling a story that is relevant to the different actors in the field rather than the researcher's own story.
	Emphasizing the problematics of the research situation	Presenting the more complex dimensions of the findings, with an emphasis on the insightful rather than the generalizable

In conclusion, the authors indicate that the conduct of research within the symbolic interactionist tradition implies the adherence to certain principles that guide the research design, the data collection process, and the presentation of the study's findings. They give

Table 4.3 as a summary of the criteria that would be used to evaluate sound symbolic interaction research.

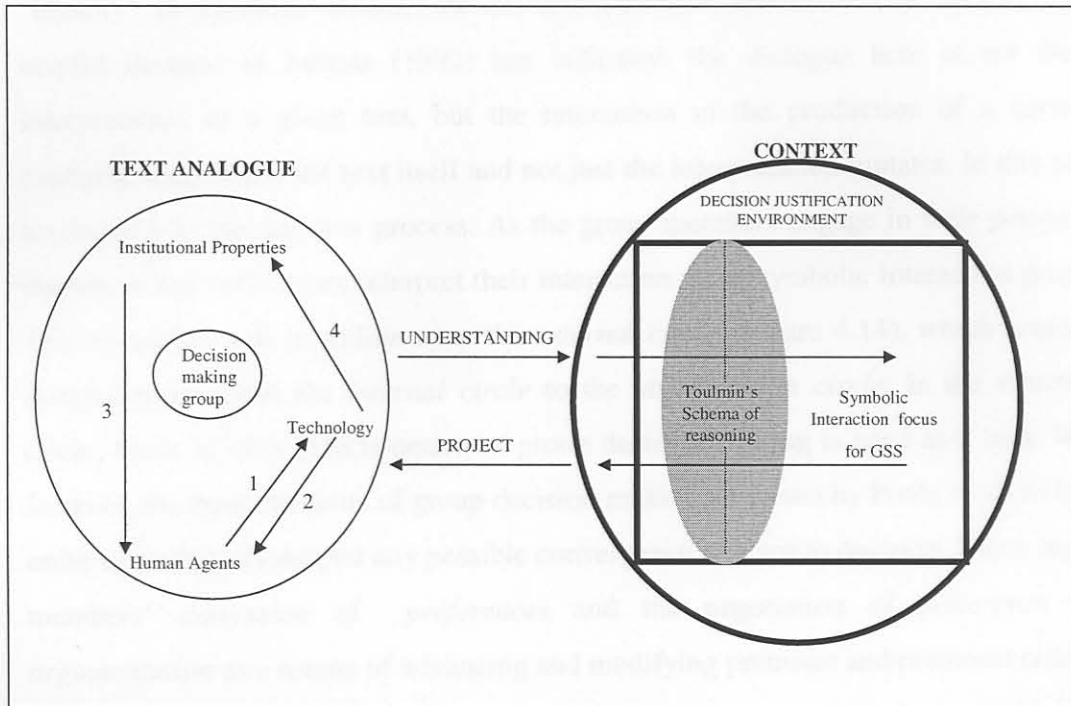


Figure 4.14: Group decision-making and Symbolic interaction research focus for GSS

We conclude by a brief description of how symbolic interaction ideas would be used in the research framework.

Firstly, like all the other theories included in the framework, we will use it as one of the lenses through which to look at and interpret empirical data. Secondly, because our analysis approach is interpretive, symbolic interaction naturally adds to our interpretive repertoire. Lastly, its principles strengthens our theoretical argument for a decision justification social practice, especially its notion of *roles*, which emphasizes socially defined expectations of behaviour for individuals in particular social positions. Assuming that the group members all agree that they will have to justify their decisions to themselves as a group and to others, and therefore seek to prepare themselves for this as they engage

they engage in the decision-making process; in other words, we assume that the group agrees to the *decision justification social practice*; then a more practical illustration could be constructed from Figure 4.14 as follows:

In line with symbolic interaction requirements, the multiple realities from each group member would be surfaced and discussed. Toulmin *et al.*'s schema of reasoning would serve as a procedural guide and repository for the ensuing discussion. Then the alternative description of the hermeneutic circle as presented in Figure 4.3 is "swept in" and the group enters into a dialogue as described earlier. Each group member in the dialogue would inject a new perspective and place the rest of the group in a hermeneutic circle. We will call the alternative hermeneutic circle the *internal circle*, meaning the *interpretive level* where the group members are sharing their individual perspectives amongst themselves around the decision problem at hand. Because of the principle of "self" and "identity" in symbolic interaction, the alternative hermeneutic circle would be more helpful because as Introna (1992) has indicated, the dialogue here is not the joint interpretation of a given text, but the interaction in the production of a continually changing text; where the text itself and not just the interpretation mutates. In this case the text would be the decision process. As the group members engage in their perspectives, the researcher will in turn interpret their interaction using symbolic interaction principles. The researcher will in addition use the *external circle* (Figure 4.14), which projects the interpretations from the *internal circle* to the *structuration circle*. In the structuration circle, Poole *et al.*'s (1985) notion of group decision making is used as a lens. We will focus on the three elements of group decision-making proposed by Poole *et al.*'s (1985) in order to track and interpret any possible convergence to a group decision. These are group members' *expression of preferences* and the negotiation of preference orders; *argumentation* as a means of advancing and modifying premises and preferred orders; and *strategic tactics* members employ to win assent for their proposals. A new understanding will then be returned, through Toulmin *et al.*'s schema of reasoning to the internal circle. The requirements of Toulmin *et al.*'s schema would assist in imposing a validity check on preferences and argumentation, which will be in the form of a series of claims, grounds,

warrants, backings, modal qualifiers and possible rebuttals, which in a way would have been used by the group to reach its decision. The work of Orlikowski will also be used to illuminate the interpretation. Through this interpretive process, we hope to be able to add both theoretically and practically to a better understanding of GSS use and research, while at the same time enabling the decision making group to justify their decisions when challenged to do so.

4.4 What to look for in assessing and evaluating this study

In this section, we give a brief overview of what we regard as indicators for the assessment and evaluation of this study based on the research framework we just described. A full discussion on the evaluation of the study will be made in chapter 6. Because our chosen research method is interpretive and of a hermeneutic nature, Klein and Myers' (1999) set of principles for conducting and evaluating interpretive field studies in IS research applies. Without discussing these principles here, we give a summary of the principles in Table 4.4. We also list in point form some of the key aspects which the evaluator of this research could consider. This is not an exhaustive list, but in the author's view, sufficiently significant to guide the evaluator on what to look for in evaluating this study. The aspects are discussed in some detail in chapter 6:

- *The significance of the problem being studied and the research purpose.*
- *The philosophical foundation, the appropriateness of the research method and the analysis approach.*
- *The extent to which the research framework enable both the researcher and the decision-making group to obtain a deeper insight in the decision justification process through interpretation.*
- *The extent to which the use of existing theories in combination illuminate various aspects of the decision justification process.*
- *The extent to which the framework enable the identification of areas where the theories in use are more helpful and where they are not, thus an enhanced understanding of the theories themselves.*

- *Whether the research questions raised have been satisfactorily responded to.*

Table 4.4: Summary of principles for the conduct and evaluation of interpretive field research (Klein and Myers, 1999)

<p>1. The fundamental Principle of the Hermeneutic Circle</p> <p>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.</p>
<p>2. The Principle of Contextualization</p> <p>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.</p>
<p>3. The Principle of Interaction Between the Researchers and the Subjects</p> <p>Requires critical reflection on how the research materials (or “data”) were socially constructed through the interaction between the researchers and participants.</p>
<p>4. The Principle of Abstraction and Generalization</p> <p>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.</p>
<p>5. The Principle of Dialogical Reasoning</p> <p>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.</p>
<p>6. The Principle of Multiple Interpretations</p> <p>Requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories on the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it.</p>
<p>7. The Principle of Suspicion</p> <p>Requires sensitivity to possible “biases” and systematic “distortions” in the narratives collected from the participants.</p>

4.5 Conclusion

We have presented a multi-theoretic analysis framework based on the hermeneutic philosophy. In order to operationalise the framework, it was decomposed into five interpretive schemes embedded in a hermeneutic circle. A brief description of how each scheme would be used to seek an understanding of both the group decision-making and the decision justification processes was presented. As Gopal and Prasad (2000) have said, ultimately, it may only be through the use of multiple lenses that we can develop a useful body of knowledge about GDSS and its use. The same can be said of the group decision justification process. Because it is multi-dimensional in nature, no single lens is sufficiently robust to illuminate all the aspects that could be at play in the process. Although the use of the interpretive schemes as constructed in this framework may still leave some aspect of the group decision justification unexplored, an enhanced understanding of the process as stated in the research purpose would have been attained.

A set of principles for conducting and evaluating interpretive field studies in information systems proposed by Klein and Myers (1999) applied within each pair of interpretive schemes would enable the researcher to make deep interpretations of empirical data.

In the next chapter, we present the research design, fully describing how the empirical data was obtained. We also present the “raw data” itself, before embarking on its analysis using the research framework. All the theoretical arsenal guided by the research questions and the research framework will then be pulled together to bring meanings to sets of data which have already been collected - hopefully, bringing a further illumination on the requirements of the decision justification process. The research questions raised in chapter 3 will be revisited, with a view to seeking some responses to them from within the fundamentals of the research framework, especially from Toulmin *et al.*'s (1979) schema of reasoning. In addition, a decision justification social practice, including a particular kind of training for GSS users will be proposed.

Chapter 5

Research Design, Data and Interpretation of Results

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Chapter 5

What we call our data are really our own constructions of other people's constructions of what they and their compatriots are up to
Geertz

The Research Design, Data and Interpretation of Results

5.0 Introduction

Klein (1999) reminds us that interpretivists of all flavours should heed the often forgotten dictum that data without theory is blind and theory without data is empty. We have used various theories to construct the analysis framework presented in chapter 4, which we believe will enable us to “see” something from the data we are presenting in this chapter. Our belief is based on the fact that the research questions we have used in generating the data were constructed in accordance with a theoretically sound and sufficiently broad process-based research framework which traversed the entire research problem space. We therefore believe that it is reasonable to expect the analysis framework not to result in some blindness, even if the theories used in it are different from that used to generate the research questions. This is consistent with published work on interpretive research. For instance Walsham and Sahay (1999) used ethnographic criteria to assess the quality of their research even though their work is not an ethnography, while Geertz (1973), an ethnographer, used hermeneutics. Sawyer (2001) reports about a multi-method qualitative research approach in which *dissimilar* data sets drawn on the *same phenomena* were analysed. The phenomena in our study is the introduction of the concept of justification to the group decision-making process. Furthermore, in responding to critics of the basis of his structuration theory, Giddens had this to say:

“If ideas are important and illuminating, what matters much more than their origins is to be able to sharpen them so as to demonstrate their usefulness, even if within a framework which might be quite different from that which helped to engender them” (Giddens, 1984, p.xxii).

Through interpreting the data, we hope to obtain new theoretical insights and an enhanced understanding in line with the purpose of this research, which we have stated 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.

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

Three data sets are presented in this chapter. The first set is obtained through a survey-like (open-ended and non-quantitative) questionnaire and is presented in Part I, while the second and third are obtained through *interpretive experiments* (Klein and Myers, 2001, p. 229). Although the practice thereof is not new, interpretive experiments are a relatively new classification proposed by Klein and Myers in the interpretive IS research literature. In interpretive experiments, the data is gathered from contrived (or artificially created) situations, whereas in field studies the data is gathered from natural (or rather, social) settings (Klein and Myers, 2001). The GSS use sessions were in a way contrived in the sense that they were planned laboratory exercises which the students performed as part of their learning programme. We would have preferred to classify the GSS use sessions as 'field studies' because they were meetings of students - held at a special venue for holding meetings of that nature, and meetings are social settings. We also made some observations, had informal discussions with the students during breaks and made some notes. However, because the focus was more on the technology use, they are better classified as interpretive experiments. For ease of reference and for the sake of familiarity of most IS researchers with case studies, we will refer to the GSS sessions as *case studies*¹. The data generated through these GSS use sessions is presented in Part II.

¹ This should not be read as reflecting a lack of understanding of what case studies are, but rather as an emphasis on the importance of the classification schemes proposed by Klein and Myers (2001). While

Part I: Generating the text through a survey-like questionnaire

5.1 *The questionnaire and its rationale*

All interpretivists, us included, would agree that the most appropriate data collection method in a study such as this is a field study of an ethnographic nature. According to Cavaye (1996), field studies take place in the natural environment of the phenomenon. The researcher enters the field with a priori definition of constructs and uses systematic techniques for the collection and recording of data. In order to account and understand how groups go about justifying their decisions, an interpretivist would acceptably argue that the researcher should be immersed in the actual practice *in situ*, looking at how groups routinely *enact* the decision justification process (Silverman, 1998). At face value, it may seem unusual therefore that we instead have used a survey-like, open-ended questionnaire or open-ended interview in collecting data for this part of the research. Typically, surveys are often usefully utilised to obtain descriptive information on “hard” issues (Sahay and Walsham, 1995). This choice of data collection method was made after considerable thought about (a) the theoretical and conceptual considerations (b) practical considerations and the nature of the problem being studied.

(a) *The theoretical and conceptual considerations*

One could have chosen to be a participating observer in collecting empirical data. Quoting Schutz (1973), Ngwenyama (1996) notes that without participating observation, empirical materials can often be incomprehensible to the researcher, and interpreted from the researcher’s own alienated perspective. Furthermore, the researcher may find it difficult or impossible to develop a valid theoretical explanation of the phenomena, in the absence of the understanding gained by such observation. This is a valid argument and we will not attempt to undermine its validity. However, taking this route would have meant that in producing the text, we would have relied only on our self-produced account of the phenomena. Although

interpretive field studies are a better understood classification, interpretive experiments, although not necessarily new, are a relatively new classification.

An analysis of group decision justification and its implications for GSS use and design ideals

this would have been acceptable within the interpretive tradition, we preferred to have an account (the text) as presented by key informant representatives of the groups. Because of the nature of the research problem under consideration, neither of these choices would have resulted in a better text. Although objectivity in our observations would not have been an issue of concern, we took note of the following remark by Churchman (1968), expressed in Mitroff and Linstone (1993):

“One of the most absurd myths of the social sciences is the “objectivity” that is alleged to occur in the relation between the scientist-observer and the people he (or she) observes. He (or she) really thinks he (or she) can stand apart and objectively observe how people behave, what their attitudes are, how they think, how they decide.... [it is a] silly and empty claim that an observation is objective if it resides in the brain of an unbiased observer.” (Mitroff and Linstone, 1993, p. 89).

To us this meant that even though our own subjectivity would have been acceptable in the production of the text from the observations, we still would not have been able to capture everything. We however do not deny the fact that observations would perhaps have given us a different insight, but both Boland (1991) and Lee (1994) would argue that an equally rich insight could also come from the text as presented by the key informant representatives of the groups. As long as we heed Schwartzmann’s (1993) advice that here, unlike in many interview studies, we need not treat organisational members’ accounts as true or false indicators of organisational realities but as *narratives* with specific functions (for example shaping and sustaining images of the organisation). Our choice then became a matter of informed judgement. Because our research method is an interpretive understanding through hermeneutics, what eventually matters most is the *text*. In this respect, Radnitzky (1970, p. 27) cites Gadamer as saying that “we don’t have to imagine oneself in the place of some other person; rather, we have to understand *what* these thoughts or the sentences expressing them are all *about*”. Also, according to Lee (1994), the researcher can also develop his or her interpretive understanding through a hermeneutic interpretation of the subjects’ *documentary*

artefacts. The responses presented in Table 5.0 obtained through the use of a survey-like questionnaire are documentary artefacts of the subjects.

(b) *Practical considerations and the nature of the research problem*

Although instances where established groups in organisations are challenged to justify their decision are not rare, especially in the new South Africa, such a social practice is not yet prevalent. An outside observer into a situation where a group is undertaking the decision justification process would thus be a sensitive matter. It is for this reason that we propose as part of this study a *decision justification social practice* - a social practice which could, in a practical way, reduce this sensitivity by exposing and preparing decision-making groups to a particular way that could accompany their decision-making processes. We believe that such a social practice is achievable and we propose it later in this chapter and further expand on it in the last chapter. In the absence of the prevalence of this social practice, the best that one could have done would have been to observe the normal group decision-making processes of various groups. This exercise would however been less than helpful to our study.

Based on the considerations presented in (a) and (b), we concluded that the survey-like approach is the best data collection method for this part of our study which is consistent with the regime of truth espoused in the hermeneutic tradition.

What remains now is for us to describe the logics of the questionnaire, how it was designed and administered and why it was administered in that way. We do this in the next section.

How the questionnaire was designed and administered

We have already indicated in chapter 3 and in the introduction of this chapter that a process-based research framework described by Roode (1993) was used in generating the research

questions. Eight open-ended questions which spanned the entire research problem space were formulated. Accordingly, these were the *What is? Why is? How does? and How*

should? type questions. Responses to the questionnaire were to be in the form of written text by key informant representatives of decision-making groups within identified organisations. The organisations identified were those that according to us, were perceived to be routinely engaged in making decisions which have major social implications. This is in keeping with the philosophy of the social construction of technology about which Sahay *et al.* (1994) advise that sampling and data gathering be conducted amongst relevant social groups, rather than aiming at a representative sample of the total population, as would be the case in positivistic research. The questionnaire was mailed to 200 CEOs of such identified organisations in February 2000. A three months period of data collection was allowed. 53 responses were received, with 30 fully completed questionnaires by the end of April of the same year. Two of the respondents preferred face-to-face interviews while two others preferred to have a telephone conversation. These responses were transcribed onto the questionnaires by ourselves. The remaining 19 of the responses were in the form of letters, explaining why it was not possible for them to complete the questionnaire. Although not included on the text as presented in Table 5.0, the explanations are, however, very helpful and are thus considered as part of the empirical data and would thus be interpreted as well. The response rate to the questionnaire was thus 26.5%. The covering letter which accompanied the questionnaire, the sample of the questionnaire itself as well as a list of organisations to whom the questionnaire was sent are separately available. The text from the 34 respondents is shown in Table 5.0 in the next section.

5.2 *The text: responses to the questionnaire (raw data)*

Table 5.0 below contains the eight questions that were asked together with exact responses from the 34 respondents. Other than to observe confidentiality, we did not edit the responses. Regarding the letters, some were very interesting while others indicated time

constraints as their reason for not responding. Here is an example of a very interesting letter response:

“Given the nature of his diplomatic functions, Ambassador X does not unfortunately respond to this kind of initiative. He wishes you well in your study.”

Another interesting observation was that a few respondents took great efforts to respond to a request they did not read. Here is an example showing that the respondent miss read the heading of the request - and clearly never read the rest of the request, even though it consisted of only seven words (the heading read: request for your assistance in the study):

“Thank you for your application dated 26 February 2000. Your request for financial assistance was carefully considered but we are unable to offer you support. We realize the importance of your work and wish you the best of luck in seeking funds elsewhere.”

Three respondents were concerned about confidentiality issues while one was upfront about receiving a copy of the thesis once completed. Generally, the letters reflects different meanings which the respondents attached to the request to assist in responding to the questionnaire. We will attempt in Part III to interpret these meanings.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/ department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
1	Some decisions are based on proposals that are submitted by our partner organisations to fund their projects. When this proposals are declined, it is necessary to give an explanation, especially for key organisations or individuals who occupy important positions.	Even those that don't deserve a response, the organisation is courteous to respond.	Not to side-track on our focus and strategy. Budget reasons	When a proposal is received, acknowledgement is done telephonically, then a formal letter is sent to explain the decision.
2	<ul style="list-style-type: none"> • Allocation of IT expenditure (amounts on types etc.) mostly of a capital nature • Types of IT Infrastructure (hardware, software) supported standards etc. • Levels of development, maintenance effort on new and current systems • Staffing levels 	<ul style="list-style-type: none"> • Always respond based on facts & projected future (where applicable) • Response always provided, even if simply stating the obvious. 	<ul style="list-style-type: none"> • Due to the situation that IT department is ultimately and fully responsible for total IT (infrastructure, projects, daily activities, provision of info etc.) in this organisation 	<ul style="list-style-type: none"> - Arrange meeting with relevant/affected parties, where necessary. - Communicate in writing (i.e. e-mail) where appropriate. - Clarify telephonically depending on type of decision. - Use existing (management level) where appropriate & affecting a number of business areas.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
1	I think I am satisfied	Usual procedures is to sit down with other managers, discuss the matter and make a decision. No particular tools are used. Objectives of the organisation give framework on decision making.	Yes, especially procedures.	People usually understand and accept the explanations.
2	-----	- Business intelligence software - Project management procedures - Discussion at meetings - Informal discussions - Change control procedures	Yes, not a large organisation - prefers a quick and efficient resolution.	Sometimes need to explain in greater detail, especially if party is not fully informed about procedures or background info. (i.e. situation history etc.)

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/ department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
3	Yes, I always have to explain or justify my decisions to the MEC, the Head of Department, the Executive Committee of the Provincial Legislature, the National Department of Education, the Trade Unions and the communities served by the Department. When services of redundant teachers are terminated, when over expenditure on personnel occurs, when new posts have to be created, those decisions have to be justified to all stakeholders	I find them compelling because they have a profound impact on other stakeholders in education.	Because the decisions we take have an impact on the future of qualitative education and the needs of all learners - young and old - and the economy of our province and country.	We call the relevant stakeholders to a meeting and give purpose and reasons why certain decisions were taken. We also use the bargaining fora to disseminate information, print and electronic media are also used.
4	Yes: - Within the department, decision must be explained in order to facilitate its implementation - contributes to the "buying-in" process. - The structure of the Institution requires some explanations at a higher level- i.e. Faculty Board. - The dynamic nature of the IT field warrants explanation of some decisions especially IT - illiterate persons.	In most instances, it is useful and contributes towards a culture of openness. However, where questions are deliberately phrased so as to react negatively to a decision - no additional justification will help.	missing page	missing page

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
3	I am relatively satisfied but there is room for improvement. I wish we could be connected to more stakeholders, such as schools and district offices, through e-mail or computer networking to communicate more frequently and faster.	Education Management Information System Consultations in bargaining forums, legal services, legislation, the budget, etc.	The understanding ranges from fair to sound.	Some people accept readily, more especially those in management echelons, but unions often question our decisions.
4	-----	Distribution of documentation prior to making the decision. Major decisions are ratified at higher levels - Faculty board, Senate, etc.	Yes.	No. Our policy-making procedures lacks a feedback loop - sometimes causes difficulty.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
5	Yes. XXX is an independent organisation attached to YY. Regular feedback to a management board takes place twice a year. Important decisions are taken in consultation with the Dean of Humanities.	Adequate	Transparency, openness, other opinions and to cover myself	Planning internally Motivation- preparation Presentation
6	Yes. WWW is a public institution that is called on by the press to provide information on & to explain certain national policy processes.	Compelling	As a public institution whose decisions may affect the functioning of the economy, it is imperative that we provide the reasoning behind organisational decisions.	Press releases and in certain instances granting interviews with serious constituency representatives.
7	Staff Board of Directors Public International secretariat/Board	Deserving Necessary	To justify reasons given for action	Some: verbal explanations Some: verbal and the minuted Some: written

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
8	Yes. Budget for IT Principles for IT architecture Key decisions desktop issues that affect users	Normally these directly impact budgets and people, therefore take them seriously.	Support functions and broad institutional frameworks require agreement to be sustainable	Task forces are used to do the planning and joint working sessions to get buy-in.
9	- Peromnes evaluation - man - Industry - Advisory committee - (IT) - student visits - Potential students and their parents: individual, school visits, - General - individual visits from government officials & other industries. - Students, SRC - Dean, staff	I market my department with every opportunity I get. I see justification of decisions as a way to help others understand what we try to achieve in it.	For the purpose of transparency so that stakeholders can be motivated to work together towards a goal(s).	Opportunities for decision justification: - Peromnes - Meetings - Informal sessions - Strategic planning sessions

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
8	No serious problems but ensuring commitment to decisions actually “sticks” is important	Thinktools for strategy. Structured problem analysis (based on theory of constraints) for action planning Total cost of ownership for IT	JIT education is normally sufficient.	TCO has to be revisited.
9	Justification of decisions depend a lot on individual drive. Options mentioned above should be sufficient.	Strategic planning (limited) General policies & procedures (limited) Management (limited)	Mostly	Frameworks have to be revisited - creating a chaotic environment not conducive for decision-making.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
10	Meeting of University bodies, interviews with staff members and student bodies, state departments, press, parents of students, other interested persons from the private and public sector.	Mostly reasonable	To give clarity in cases of misunderstanding or rumours; to be transparent, to build a good image of the institution, to promote communication with staff.	Regular communiqués and circulars from the Vice-Chancellor/members of Management/ Public relations section depending on the topic and nature of decisions.
11	Yes. The department is called upon to justify: - what we include in the curriculum from both a theoretical and practical point of view; - why we do or do not accept an application from a student for leave of absence; - why an application for a supplementary or special examination is not approved; - why we do or do not accept an application from a student for credit for a course taken at another institution; - why we do or do not accept an application from a student to register for a particular course or degree.	In some instances, the application is so weak that a response is almost not deserving. At other times, the applicant or requester deserves to know why a particular decision has been made.	Consistency of application of decisions or more appropriately that a consistent process is followed must be seen to be working. On a more down to earth note, applicants are sometimes woefully ill-informed that they need to be told why certain decisions have been made.	Both the process and the rules for making decisions are clearly defined, so that when a decision must be justified, it can be done relatively swiftly and with limited problems. Again, on a more down to earth note, all requests are made in writing as all are responses. Most decisions are accompanied by a reason (justification?) why.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
10	Generally satisfied. There is always room for improvement.	See 4 above. Also regular consultations via visits by Management members to departments/divisions; work- lunches with senior staff members (academic and non-academic), meetings of vice-chancellor with all staff, availability of complaint channels, as well as a Staff Forum and institutional Forum, etc.	Yes, provided that all written documentation is available in Afrikaans and English.	Generally satisfied. Where necessary, revision takes place through processes of consultation.
11	Satisfied. However, rules and procedures can always be amplified and made easier to understand so as to obviate or limit future justifications.	These may seem somewhat abstract: <ul style="list-style-type: none"> - precedent; - context (the department operates within the context of the Faculty, University) - Full departmental discussion to establish principle, process and rule. - Full records to ensure a firm and reliable basis from which to make a decision (the full current academic record of a student, including attendance record, is attached to an application for any concession from a student. 	Mostly	Most applicants accept, albeit grudgingly, the decisions and associated explanations. However, it would be true to say that, true to life, each applicant vigorously contends, that they are a special case warranting different treatment. This should not be construed as a weakness of the system or the justification or the process of justification of its decisions.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
12	Yes, in decisions that affect the work in terms of time and resource requirements from other departments.	In such occasions, I find them compelling due to the fact that failure to justify means there will be little or no co-operation.	Because people normally only respond positively to issues when they are explained or justified	When we realise that our actions require co-operation from other departments.
13	<ul style="list-style-type: none"> - To the Director General who is the Executive head of the province. - To Head of department in which the information technology department resides - To the central information technology committee that functions as the official IT governance in the province. -To the departmental IT committee - IT governance at provincial departments level 	In all the above occasions it is reasonable to expect some form of justification.	<ul style="list-style-type: none"> - Important to communicate the rationale for setting strategic direction - Ensures that decisions are better understood and accepted by stakeholders - Justification establishes a logical and rational need for the decision made. 	<ul style="list-style-type: none"> - Visual presentations - Workshops - Meetings (group) - Meetings (one-to-one)

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
10	Generally satisfied. There is always room for improvement.	See 4 above. Also regular consultations via visits by Management members to departments/divisions; work- lunches with senior staff members (academic and non-academic), meetings of vice-chancellor with all staff, availability of complaint channels, as well as a Staff Forum and institutional Forum, etc.	Yes, provided that all written documentation is available in Afrikaans and English.	Generally satisfied. Where necessary, revision takes place through processes of consultation.
11	Satisfied. However, rules and procedures can always be amplified and made easier to understand so as to obviate or limit future justifications.	These may seem somewhat abstract: <ul style="list-style-type: none"> - precedent; - context (the department operates within the context of the Faculty, University) - Full departmental discussion to establish principle, process and rule. - Full records to ensure a firm and reliable basis from which to make a decision (the full current academic record of a student, including attendance record, is attached to an application for any concession from a student. 	Mostly	Most applicants accept, albeit grudgingly, the decisions and associated explanations. However, it would be true to say that, true to life, each applicant vigorously contends, that they are a special case warranting different treatment. This should not be construed as a weakness of the system or the justification or the process of justification of its decisions.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
12	Things work generally very well.	- Memos/ e-mails - Staff meetings/ interdepartmental meetings	Yes they are commonly used (understood?)	Mostly people accept these explanations.
13	Yes, generally satisfied.	- Central information technology committee governance process - Departmental information technology committee governance process - Documented IT policy and strategy - Documented conceptual architecture - Documented IT domain architecture Master systems plan framework	Well understood but perhaps not used effectively.	Sometimes compelled to revisit.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
14	<p>There are numerous occasions. For example:</p> <ul style="list-style-type: none"> - Explain budget limitations to project managers - Justify office expenditures vs. head office organisation - Explain to local organisations reasons for impossibility to meet their requests for funding. - Justify overhead costs to recipients for funding 	Need for justification/explanation varies. There are occasions/instances which do not require/deserve a response. On many occasions clients superiors or staff members may reasonably expect explanations.	Decisions should be transparent. If no reasons were given, clients, superiors or staff would suspect that the decision was arbitrary. Also in order to maintain client satisfaction, reasons should be given.	<ul style="list-style-type: none"> - Response by phone and explain. - Call a meeting and explain - Written response - Regular reporting and sharing of information during management team meetings - If necessary request or provide additional information.
15	Yes - If related to our line of work	Yes	It is necessary if not fully understood by person(s) enquiring	Detailed explanation and patience
16	Yes. e.g. explain national librarianship vis-à-vis academic, public, education, special libraries.	In my organisation's own interest.	explain national librarianship	<ul style="list-style-type: none"> - Personal - Newsletters - Listservers

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
14	If possible by delegation of responsibility to persons directly involved, to meet requirement of informed decisions. Increased delegation would however require double-checking.	- Organisational handbook (our), now also available on CD-ROM and via internet. - Signing powers for financial transactions remain with office director and personnel seconded from Germany. Regular management team and staff meetings.	Generally Yes. We try to give additional explanations if required and provide additional training and/or coaching if some rules are not so well understood, there is a need to standardise some of our procedures (standard replies to recurring requests)	At the request of the South African government, we have revisited some of our procedures and frameworks with a view to simplifying and streamlining approvals of projects or preparatory activities for projects.
15	Once fully explained we are satisfied.	Verbal and written	Yes.	People are mostly satisfied but if necessary topic will be revisited.
16	OK	- Budget - Strategic Planning Committee - Legislation - Board - Market needs/ requirements	OK.	Fair to good Unions often different matter

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
17	As YYY is a funding organisation, one of our department's main functions is to draw up appraisals to present to the trustees or board for funding. This entails long justifications as to why a particular project should be funded.	This type of justification is part of our core job.	Yes, no decision should ever be taken without some thought and this should inform any justifications required.	The department has set report formats and meetings (as mentioned above) for such needs
18	We often have to justify decisions: - To funders in terms of how we have used their money [via funding reports] - To clients during projects, as part of measuring progress [usually during meetings] - To ourselves, as we chart the broad direction of the organisation and ensure it is in line with our vision/mission [during weekly/annual planning sessions] -To our Trustees, in terms of broad vision [during BI-annual meetings]	The above are all compelling in principle. Sometimes there is a mismatch between clients/funder expectation and our contractual agreement, and this can lead to problems.	Because we need to be held accountable for our actions, and have to ensure that we meet client/funder expectations. We also have to ensure that we do not lose sight of our organisational mission in the hurly-burly of daily activity.	We have broad planning frameworks, project justification tools, and budgeting templates to help us make decisions. Meetings are a critical way of responding.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
17	I am generally satisfied however, meetings do tend to spend little time discussing justifications.	Project appraisal formats, report formats, meetings, discussions, etc.	Mostly	People readily accept them.
18	Generally satisfied - sometimes we get overwhelmed by the quantity of work and time for making decisions becomes a problem.	See answer to 4.	Generally well understood	Sometimes we have to revisit them - also form a useful archive.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
19	Upgrades for infrastructure for budgets. Salary increases to unions and staff. New producers or processes.	In most cases on reasonable and satisfactory grounds.	Due to technical nature of IT, it is necessary to justify decisions in terms that is understandable . IT interfaces with most functions, e.g. finance, administration, human resources, etc.	Personal contact and/or written response
20	As a statutory body, SSS is accountable to the public and social partners. policy decisions are determined by the government, business & labour. These reps are accountable to their constituencies, and decisions are in consultation with their constituencies. SSS receives queries (relating to circumstances surrounding a case usually) from external bodies, which are explained in a response. Departments & provinces need to explain decisions in management meetings & possibly to the governing body.	As a statutory body, we are required to consider each query as deserving a response. Most queries stem from a lack of understanding of legislation and SSS policies & procedures, and it is one of the SSS's functions disseminate such information.	We are a public funded institution. We are a statutory body and our functions are legislated. Criticism is important to ensure we are responsive to the public's needs - justifying decisions is part of this.	In writing for external If an internal query, possibly in writing or in a meeting (ad hoc or scheduled)

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
19	A written response with personal contact to explain or sort out differences or misconceptions, depending on the complexity of the decision	Management Information Mathematical Models Spreadsheets Presentations Workshops	No, not always.	Sometimes compelled to revisit e.g. resource restrictions (e.g. budget)
20	The means of responding currently is appropriate.	- Year planner - Action plans - Technology - information dissemination - Staff meetings - Reporting ensured in monthly reports	Yes, they do. One major problem with communicating decisions is “information overdrive” where too much information is communicated to staff thus diluting the impact of decisions - this is particularly common with the use of e-mail where documents are so easily distributed.	It is common that procedures and frameworks are revisited. This is particularly due to the TTT being a relatively new organisation, which is regularly amending policies and procedures, and undergoing more restructuring.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
21	Yes, such occasions do arise.	The occasions are usually compelling, but may also not deserve response.	The reasons for justification are related (1) unpredicted change of circumstances (2) need for intervention that needs resources; and (3) to enhance or protect the image of the organisation	The process involves a detailed description of the changed circumstances, explanation of problems arising from that, and proposal or decision for intervention.
22	Yes. Policy issues around human rights, e.g. death penalty. Accountability to our members, employers, general public and funders.	Mostly compelling. In very few instances are they deserving of no response.	We are accountable to the various constituencies mentioned in 1. above.	Letters, Memos, Reports and Press statements.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
21	We are generally satisfied with the response	Mission Goals Plan of action Strategies adopted at higher level Discussions locally Workshops	Yes, these are understood	Very occasionally one needs to revisit the procedures.
22	It is fine right now	Board of Trustees policy Leadership opinion meetings Discussion documents	Yes	Generally accepted. Sometimes compelled to revisit.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
23	Certainly, within our advisory Board, the Faculty or the Management Committee of the University. Outside our sponsors, provincial government or organised trade and industry.	Very often yes. For the sake of transparency and plain good communication, it is most of the time compelling on satisfactory grounds. Due to ignorance or lack of insight it is sometimes unnecessary and does not need a response.	Purely for the sake of transparency and good communication habits. We also have a duty and responsibility towards our financial supporters.	Every case is treated on merit. Most often it can be justified by computer information.
24	All decisions have to be justified, so on most occasions such justifications/explanations have to be given.	Yes, for the sake of transparency there are always compelling grounds for explanation/justification.	For reasons of transparency and fairness.	Because of the organisation's policy on transparency and social justice, decisions are required to be accompanied by explanations and reasons or justifications.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
23	We are satisfied. It is important though that all decision justifications are based on proper information and facts.	Records of all activities/functions Proper records of financial matters Needs analysis of target groups Computer based systems	Generally yes. There might be odd occasion where these tools are ignored.	Generally yes. When it is discovered that procedures and frameworks are no re up to standard, it is changed to suit the needs of inside and outside parties.
24	Yes, I am satisfied.	Prior situation analyses and evaluations based on facts and/or reliable data, as well as individual and/or group consultations and discussions.	Yes, decision-makers are expected to understand them well, else they would not be decision-makers.	Mostly yes, but sometimes reviews are required when necessary.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
25	Financing decisions Strategic alignment Adjudication of tenders Expenditures within the department.	They are reasonable and compelling; i.e. there is a reason behind such an enquiry.	To ensure budget integrity. To ensure strategic alignment. To enforce governance.	Respond to the request in an appropriate manner; i.e. make sure that the objective of the request is met.
26	The very nature of the policies that govern the functioning of my organisation embodies such values as transparency, professionalism, equity, fairness, participation and accountability make abundantly clear that we need to justify virtually every decision we make. Starting from budgeting and planning, my organisation has to make value choices. We have to prioritise what we want to spend the limited resources at our disposal on. These choices have to be defended before the budget committee. This is where my department justifies their decisions. We are holding in trust public funds for public or common good, we are therefore not at carte blanche to spend wily nilly. We are accountable to the public. Through our political head we table our budget speech at the legislature for all sectors to poke holes at it. This provides us with another chance to defend our decisions to the public. As a co-ordinator in the province, my office receive requests from various stakeholders that are looking for explanations on decisions taken by our departments, ranging from questioning the process, approach and impact of our activities. This calls for a rapid response. To this end we have established a unit called Rapid Response Unit that deals specifically with queries from the press, communities and other stakeholders.	All queries are treated with utmost urgency. It is not for my department to award marks for queries but it is vital for us to respond. Perceptions, in my view should be well contained in order for any organisation to succeed. No query in my department will go unattended. I am creating a responsive, reiterative and reflective organisation whose aim is to satisfy its customers.	As has been stated in question one, to justify our decisions is not a choice but a way of doing things that is enshrined in the constitution of the country. We are following the model of an entrepreneurial government, which puts the customers first. When one looks carefully at Batho Pele, one clearly sees that decisions taken by government on behalf of the public must be sufficiently justified to the public.	To a great extent it depends on the nature of the query. There is no prototype rigid way in which we justify decisions we have taken unless so stated by a policy or legislation. When we are in a situation like this, what I normally do is to assemble the relevant officials to formulate a report. Once all inputs have been made, the response is then forwarded to the people or institutions that have asked for it. If there is need for a meeting, we convene it and discuss issues openly.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
25	I am generally satisfied about the way in which the department responds to the need of decision justification.	Management Information Systems Executive Information Systems	Not necessarily	People trust the source and tend to rely on the information provided.
26	I am fairly satisfied with the way we respond in my department, however the same cannot be said about all the departments in the province. What I would like to see happening is for all the departments to have a crack team of officials whose job would be to act as Rapid Response Unit. The team must consist of diverse skills. It is in a multi-disciplinary team that a department will be able to coordinate inputs for a report that justifies their decisions. Be that as it may I think a lot of time could be saved by communicating with stakeholders right from the planning level. That way your decision becomes their decision and you will be able to minimise queries significantly. Justification of decisions taken is to me a stopgap measure which reflects that before the decision was taken there was not consensus building with stakeholders. It is therefore vital that participation be stepped up running to a decision.	Nothing can replace good research before a decision is taken. One cannot over-emphasise the importance of consulting with key stakeholders for a buy in. The tools procedures and frameworks used are chosen on the merits of the case at hand. We are no longer rule-bound organisation, we are cutting down on bureaucratic tendencies, therefore we respond according to the dictates of the request at hand.	Irrelevant	When enough research has been done people accept the explanations, however if the opposite is true we are compelled to revisit our responses until we have satisfied the people. I am happy to say that I cannot think of a case where the latter has happened.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
27	Issues of financial management and control, justification is made to be important.	To the extent that the central government allocates money to us, there are compelling reasons to justify. On other occasions, I find it absolutely unnecessary.	To ensure that the organisation does not exceed spending limits and also to ensure that the money is used for the intended purpose.	A request is made to the Head of organisation. The relevant division is contacted to provide info. The info is then sent to the requester.
28	Our organisation is a foreign policy think tank. Besides being answerable to a board, we have a broad constituency in government and civil society as well as regional, continental and international networks. The choices and outcomes of our research activity have to be evaluated by the board and have to have an impressive value to our beneficiaries/constituencies. In this sense, choices of projects (decisions) must be justified in terms of their relevance and utility.	The organisation has core analytical competencies for which it enjoys a healthy reputation. There have been occasions when certain projects focus vs. preferred others had to be justified. This has been the case with government departments and potential donors. If not constructive or suggestive, they will tend to be ignored.	We are an NGO driven by an ethos of transparency and accountability. We therefore have a responsibility to demonstrate how resources are used and to constantly evaluate the impact of our work.	Depending on the end user, communication is entered into and a level of debate is provided. A government enquiry will warrant a considered response because it is a primary user of our research. Donors are treated more or less the same. Partner organisations will usually get a phone call or e-mail.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
27	Satisfied	- Minutes - Legislation - Databases	Yes	Often asked to revisit.
28	The YYY has a range of publications and research outputs which serve as primary outlets for communication. These are supplemented by seminars, symposia, workshops etc. Face-to-face discussions with decision-makers in government, NGOs, business etc. are useful.	Conferences, Workshops, roundtable discussions, issue forums, internship and visiting scholar programme, teaching and lecturing, commissioned research, travel abroad, partnerships with other organisations, policy briefing papers.	The are mediums we have to implement our mission and they are generally supported by a very broad constituency.	It is useful to revisit projects and decisions underpinning them periodically because our work concentrates on a dynamic and fast changing international environments.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation / department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
29	In pursuing the 3 main thrusts of the TTT foreign policy - to enhance national security - to undertake economic diplomacy and - to promote and protect the interests of TTT living and working overseas, justification for all decisions taken will always have to be made.	Justifications will always have to be made but only when required by circumstances. But, while justifications exists, they need be explained or even divulged.	An Embassy exists as an extension of the State and thus responsible to its people. Justifications offered will have to be parallel to the thrust of foreign policy	Sufficient data are gathered and reports are made in accordance with it. This usually form as the basis of the decision. So when justifications must be made, a data-look back will usually provide the answer.
30	Yes. Road shows to area and branch offices in the province.	Necessary to share information and decisions with lower ranking officials.	For everybody to understand management's line of thinking and to respond to some criticism.	- Monthly newsletter through PR department - Internal memorandums - Information passed on via middle management - Internal staff meetings addressed by top management.
31	- Accountability to parliamentary or legislature structures. - Public when they enquire - Public when there is a change in policy or implementation - Internally when policy changes - Labour organisations.	Mostly compelling due to reasonable and satisfactory grounds.	We serve the public and use their taxes. it is important for clients to understand our policies and changes thereof.	Relevant persons to address the issue are identified. Data collected. The means to respond are chosen e.g. in writing, telephonically, media etc. Evaluation after response.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
29	Yes.	Please see 4	The existing tools, procedures and frameworks as they are ,are well understood by the officers, who make the decisions.	People differ. A good explanation to one may not be good to another. Hence, procedures and frameworks must be open to possible changes and refinements.
30	Generally satisfied	Management meetings PR departments	Yes, in most instances.	People not always satisfied.
31	No. Proper co-ordination at stage of choosing respondents. Accuracy & completeness of data Pro-activeness is key.	- Constitutional and legal frameworks - Availability of resources - Policy speeches	No.	Sometimes compelled to revisit.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/ department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
32	Meetings of the Executive of the University. Meetings of the Senate of the University. Meetings of the Council of the University. Marketing forums in the University. Interview with the media. Meetings with the unions on the campus.	In almost all cases I feel obliged to respond by providing facts and compelling reasons.	The University is largely dependent on public funds and is therefore liable to the public at large.	The process normally includes the provision of facts and compelling arguments for actions taken. The latter actions should be taken in the best interest of the students of the University and the country as a whole. In several cases the marketing department of the university responds proactively.
33	Yes. (((interview))) - Institutional bias (students) - To donor community (on activities) - To Department of Education - Guided by policy	Every query deserve a response If addressed to office, it needs a response.	If not, could lead to unresolved issues due to misunderstanding. So people can see the basis on which the decision was made	Depends of how it was brought up (e.g. students) Maintaining policy.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
32	I am generally satisfied. The Director of Marketing has the task of presenting such decisions to the media and interest groups in a convincing and positive light.	<ul style="list-style-type: none"> - Presentation of facts and figure - Justification in terms of the mission of the University - Decisions are taken after wide consultations: therefore transparent and democratic. - The national standing of the University and its thriving for international recognition - The output of the University in terms of research and graduates - Hierarchical progression of decision-making. 	Yes, I believe they are.	Both. They are readily accepted, but the context is changing at an increasingly rapid pace and therefore people need to be constantly reminded what the bigger and total picture for decision-making in the University involves.
33	Yes. But I feel could go a little further. More consultations with recipients, frequent meetings, but resources are limiting	Assets in the form of funds	Yes, they are - at implementation level	Not really. Sometimes they do not. Individual expectations sometimes not met.

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4
	<i>Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?</i>	<i>If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?</i>	<i>Why, in your opinion do you think it is necessary for your organisation/ department to justify some decisions?</i>	<i>How does your organisation/department normally go about in responding to such a need for decision justification when it arises?</i>
34	<ul style="list-style-type: none"> - Submissions to Board of Directors. - Corporate strategy to stakeholders - Presentations to potential partners - Submissions to government departments. - Presentations to communities. 	Compelling due to reasonable & satisfactory grounds.	My organisation is the successor in title to the former homeland based organisations. Its repositioning in the current politico-economic dispensation is dependent on the successful clarification of its role and mandate.	<ul style="list-style-type: none"> - Formulate conceptual framework - Collect & collate data - Analyse info at disposal - Identify best strategy or plan - Canvass internal stakeholders - Obtain necessary authorisation - Implement

Table 5.0 : Results - Questionnaire responses/interviews

RESPONDENT	QUESTION 5	QUESTION 6	QUESTION 7	QUESTION 8
	<i>Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?</i>	<i>List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions.</i>	<i>In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arises?</i>	<i>Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?</i>
34	- Not satisfied as such - Would welcome the process if speedier as it is currently almost bureaucratic.	- Management workshops - Board workshops - External advisors	Not always appreciated.	Need do revisit procedures and frameworks as the operating environment is dynamic.

5.2 Coded questionnaire results using Morphological Analysis

The text as presented in Table 5.0 was analyzed using a combination of morphological analysis and some aspects of grounded theory. Neither of these techniques was used in its original sense. For instance in using grounded theory, we focused only on two key aspects, the *seed categories* and their *properties*, which corresponds in morphological analysis to *leading variables or dimensions* and *discreet conditions*. In simple terms, these are the column headings and the various descriptions identified as falling under each heading. Although a tedious process if performed manually as we did, the technique is straightforward. For each question and from each respondent, we identified the leading variables and their discreet conditions as described in the text presented in Table 5.0. Following this process, a consolidated series of morphological fields was created. The leading variables are reflected in the first column of Table 5.1, followed by a list of the discreet conditions in the second column. The third column shows a total count of the “discreet conditions” for each leading variable. The leading variables were then ranked in accordance with the total number of identified discreet conditions. The complete results from this process are shown in Table 5.1 below. It is important for us to indicate that the *discreet conditions* terminology as used here simply refer to variable properties which are not necessarily mutually exclusive as in the strict sense of morphological analysis.

We paid no particular attention to the distinguishing features between morphological analysis and grounded theory as pointed out in chapter 3. This was because we did not find this necessary since our interest was in using them as analysis techniques and data organizing approaches rather than as vehicles for theory building. Our theory building process is based on the use of the framework we have constructed in interpreting the text as presented in both Tables 5.0 and 5.1.

Table 5.1: Consolidated Morphological Fields

Question 1: *Are there occasions in your organisation/department when you have to justify (explain in some detail) your organisation's/department's decisions to other people, whether within or outside the organisation/department?*

Leading Variable or Dimension	List of discreet conditions	Number of discreet conditions	Leading variable rank
Stakeholders	Constituency, civil society, senior government officials, networks, requirements from other departments, branch offices, donors, international secretariat, staff, labour unions, forums, clients, ourselves.	13	1
Legislature	Transparency, professionalism, equity, participation, fairness, parliament, policy, accountable, value choices, common good.	10	2
Budget committee	Financial control, salary increases, infrastructure upgrades, budget limitations.	4	3
The Public	Policy changes, presentations, if related to our work, reasons for impossibilities	4	3
The Board	Research outcomes, beneficiaries, relevance and utility, meetings	4	3
Always	resources held in trust, every decision	2	4
The press	interview with media	1	5

Table 5.1: Consolidated Morphological Fields

Question 2: *If such occasions do arise, do you find them compelling due to reasonable and satisfactory grounds; or do you find them deserving no response in some instances?*

Leading Variable or Dimension	List of discreet conditions	Number of discreet conditions	Leading variable rank
Vital to respond	Always compelling as they have profound impact on other stakeholders, in most cases compelling, need to explain why justify, share information, to contain perceptions, to satisfy customers, allocated funds, need to be reflective, even those that do not deserve it, it is courteous to respond, deserving, if addressed to office, for good communication, it is part of our jobs, in my organisation's own interest, little or no co-operation if failing to justify, always necessary even if stating the obvious, it is reasonable to expect it, when required.	18	1
Absolutely unnecessary in some instances	Very few instances, due to ignorance, very weak cases	3	2

Question 3: *Why, in your opinion do you think it is necessary for your organisation/ department to justify some decisions?*

Could see the basis of decisions	Communicate rationale for strategic decisions, it establishes a logical and rational need for the decision made,
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Table 5.1: Consolidated Morphological Fields

Question 3 cont.: *Why, in your opinion do you think it is necessary for your organisation/ department to justify some decisions?*

Leading Variable or Dimension	List of discreet conditions	Number of discreet conditions	Leading variable rank
Could see the basis of decisions	People respond positively to issues when they are explained or justified, consistency of application of decisions must be seen, to justify reason given for action, decisions have impact on society and economy.	6	1
Avoid misunderstanding	Understand management's line of thinking, understand policy and its changes, organisational mission, technical understanding, ill-informed clients, give clarity in case of rumours.	6	1
Our way of doing things	Responsibility, evaluate impact, build good image, transparency, fairness, accountability.	6	1
Minimise unresolved issues	Respond to criticism, clarification of role and mandate, when people enquire, good communication, to keep focused.	5	2
Stay within budget limits and intentions	Demonstrate how resources have been used, use public funds	2	3
Enshrined in constitution	Are public institutions whose decisions may affect the functioning of the country's economy.	1	4
Customer first	Meet client's expectation.	1	4

Table 5.1: Consolidated Morphological Fields

Question 4.: *How does your organisation/department normally go about in responding to such a need for decision justification when it arises?*

Leading Variable or Dimension	List of discreet conditions	Number of discreet conditions	Leading variable rank
No rigidity unless by policy or legislation	Call meetings to formulate a response report, planning frameworks, forward response to those asking for it, discuss issues openly, telephone and letters, press releases, list servers, detailed verbal explanations, use e-mails	9	1
Use of organisational artifacts	Newsletters, written response, memos & minutes, other communication channels, visual presentations, workshops, report formats, computer information, reports	9	1
Depends on query nature	Get facts and relevant info, personal contacts, revisit the basis of the decision, address by top management, rules and process clearly defined, interviews, patience, evaluation after response.	8	2
Research is done	An inquiry, data-look back, proactive response, policy maintained	4	3

Table 5.1: Consolidated Morphological Fields

Question 5.: *Are you generally satisfied with the way your organisation/department go about responding to such a need for decision justification, or is there perhaps a particular way which you think should be followed?*

Leading Variable or Dimension	List of discreet conditions	Number of discreet conditions	Leading variable rank
Yes	But could go a little further, more consultation could be helpful, has skill and positive, generally satisfied, once fully explained, rules and processes can always be amplified to obviate future justification, but there is always room for improvement, are satisfied, sometimes less time for making decisions.	9	1
No	Could be done speedier, more bureaucratic, proactiveness is key, proper co-ordination in choosing respondents needed, accuracy and completeness of data needed, be based on proper information and facts.	6	2

Question 6.: *List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions*

Resources	Funds, assets, MIS/EIS, CBS, budget templates, project management procedures, business intelligence software, master system plan framework, appraisal formats, mathematical models	10	1
Research	Facts, figures, reports, databases, reliable data, documented conceptual architecture, market needs.	7	2

Table 5.1: Consolidated Morphological Fields

Question 6 cont.: *List some of the tools, procedures and frameworks commonly used in your organisation in supporting decisions*

Leading Variable or Dimension	List of discreet conditions	Number of discreet conditions	Leading variable rank
Organogram	Mission, PR department, central IT committee, department IT committee, context of larger organisation, objectives of organisation gives framework on decision-making.	6	3
Workshops	Management, board, advisors, stakeholders, strategic planning committee.	5	4
Meetings	Minutes, discussions, fora, informal discussions.	4	5
Policy	Consultation, democratic, transparent, documented IT policy and strategy.	4	5
Records	Precedent, filing systems, computer printouts	3	6
Constitutional	Legal, legislation, mandated positions of constituencies	3	6

Table 5.1: Consolidated Morphological Fields

Question 7.: *In your view, are these tools, procedures and frameworks commonly used in your organisation in supporting decisions well understood by those who need to use them when such a need arise?*

Leading Variable or Dimension	List of discreet conditions	Number of discreet conditions	Leading Variable rank
Yes	By definition of a decision maker, in most instances, I believe they are, we are at implementation level, well understood but perhaps not used effectively, provided communicated in language well understood, understanding ranges from fair to sound, generally yes.	8	1
No	Not necessarily, not always appreciated, odd occasions of ignorance, not often.	4	2

Question 8.: *Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?*

Do revisit	Operating environments dynamic, sometimes compelled, procedures must always be open for changes, periodic reviews useful, resource restrictions, continually revisit frameworks in an effort to improve policy processes, if necessary, they form a useful archive, revisit through consultation, often asked to, when enough research is done, people mostly accept them, top management accept them readily	13	1
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Table 5.1: Consolidated Morphological Fields

Question 8 cont.: *Do you find that people readily accept these explanations given within the available procedures and frameworks, or you are sometimes compelled to revisit such procedures and frameworks?*

Leading Variable or Dimension	List of discreet conditions	Number of discreet conditions	Leading variable rank
Not readily	Individual expectations not always met, people not always satisfied, people often differ, true to life - people do contest vigorously sometimes, satisfied with procedure-not necessarily agree with content, our policy making procedures lack feedback loop, unions often question our decisions, they form a useful archive, sometimes need to explain in greater detail-especially if party is not fully informed about procedure.	8	2
Both	Total decision picture needed, reminders constantly, context changes.	3	3

5.4 *Setting the scene for the use of the analysis framework*

In using the analysis framework, the series of morphological fields (Table 5.1) is used as starting points. From these starting points, we work backwards to the original text in Table 5.0. In this way, and through the various lenses of the framework, responses to our research questions are systematically sought through an interpretive-hermeneutic process. For a quick overview of the morphological tables, we created eight morphological graphs corresponding to each question, showing the *leading variables* and the number of *discreet conditions*. The morphological tables are used to interpret the data in Part III of this chapter. The leading variables and the number of discreet conditions serve as organizing frames for our interpretation using the analysis framework. A similar analysis approach in the information systems field was used by Sawyer (2001). Our table of morphological fields corresponds to Sawyer's *explanatory matrices*. Sawyer uses explanatory matrices to draw themes from different data sets. The themes are then used to help frame a return to field notes and organize data to support or refute their value.

5.5 *Conclusions on Part I*

Part I contains the empirical data which has been obtained through the use of an open-ended questionnaire constructed in accordance with the process-based framework. The resulting text was organised and categorised using a combination of grounded theory and morphological analysis. It is this categorised text which will be analysed and interpreted using the analysis framework in order to gain a deeper understanding of the group decision justification process - at least from the point of view of those that responded on behalf of their groups. This part mainly addresses the first leg of our research purpose. Next we discuss how the text from the GSS use session was generated and categorized.

Part II: Generating the text through GSS use case studies

5.6 *Thick description of the first case study on GSS use*

The notion of a *thick description* being used here is borrowed from Geertz's (1973) ethnographic studies. We use it here to refer to the entire context in which the case studies were conducted. It includes the background as well as the intention of GSS use. We heed Walsham's (1995) remark that in order to establish some credibility to the reader, researchers reporting on interpretive case studies should describe in some detail how they have arrived at their 'results'. In this case the 'results' is the text from GSS use by the group. The context of the case study is part of a learning programme of a module on systems and decision-making for masters students in the Department of Informatics at the University of Pretoria in South Africa. For this first case study, the module was presented during the period July-October, 2000 and embodied a framework to prepare groups for group decisions where justification of the decisions made is called for. The last meeting of the learning programme included a GSS software use. In order to enable the reader to make sense of the GSS transcripts which we later present, it is necessary to describe the learning programme of the group in detail.

The learning programme of the group

The group consisted of five students in a Master of Commerce in Information Systems programme. The module took four sessions of three hours each. A complete work programme was given to the students at the beginning of the module. They had to read a selected set of articles for each theme. Each theme was completed during one session. The sessions were facilitated by the author and they included discussions of the prescribed literature, assignments, presentations by the students and scheduling for each subsequent session/theme. The students completed a ten page assignment for each session/theme. The facilitator was able to assess the learning progress of the students

through their written assignments, presentations during sessions and the degree to which they were able to appropriately critique the literature. Central to the students' programme was the use of Toulmin *et al.*'s schema of reasoning, applied within a

Systems Thinking paradigm. Each student used the Unified Systems Hypothesis (USH) proposed by Hitchins and Shrivenham (in Jackson *et al.* (1991)) to construct their own conceptual 'systems view' on the Mozambique flood disaster situation. The assignment was based on a flood disaster which befell Mozambique, a poorly resourced African country sharing a border with South Africa. In February 2000, the devastating floods destroyed almost the entire infrastructure in Mozambique and many lives were lost. South Africa, together with many other countries of the world, provided support, first on rescue operations and later with some resettlement and relief support. The students had to conceptualize all this using the USH and then make a claim about their conceptualization. Their claim was to be supported using Toulmin *et al.* schema of reasoning. Our aim was partly to explore whether the schema of reasoning (Toulmin *et al.* (1979)) used in combination with systems thinking concepts could serve as a good organizing framework to prepare groups for a decision justification process which could suitably be supported by any GSS software. We next describe the sessions of the learning programme in the order in which they were conducted.

Session one:an overview of systems concepts

In order to remove the notion of a classroom lecture situation, a module handout was given to the students emphasizing that the sessions will be conducted in a meeting format. The lecturer is the learning process facilitator and does not necessarily know '*how to make good decisions*'. The complete agenda was given. Additional reading on the work of Ackoff (in Emery (1969)) and Toulmin *et al.* (1979) was given and also briefly discussed during the meeting. Each student was given an opportunity to lead a discussion based on one article. The facilitator made a presentation on various models of decision-making, including those of Simon in Harrison (1981) and the strategic choice approach

developed by Friend and Hickling (1997). There was a discussion on how an understanding of systems could assist in the complex task of decision-making. At the end, the students were required to hand in a ten page assignment a week before the next meeting on the Mozambique flood disaster situation as described earlier. Having understood the logic encapsulated in systems concepts and Toulmin *et al.*'s schema of reasoning, and having

demonstrated their understanding through conceptualizing a real life problem situation, the students were ready to engage in a broader systems thinking mode.

Session two: systems thinking, problem structuring methods and ethics in decision-making

The procedure remained the same as in the first meeting. Once again the students took turns in leading the discussions on one of the prescribed articles. The facilitator then summed up the session discussions on the board. The students were ready to do their second assignment. They were to identify a “messy” problem from their work environment and use their knowledge of problem structuring to resolve it.

Session three: critical systems thinking (CST)

The facilitator made a presentation on critical systems thinking based on the work of Jackson *et al.* (1991) and Midgley (*op. cit.*). The five ‘commitments’ of critical systems thinking as presented by Jackson were analyzed and discussed. The article by Midgley on what it means to be critical about systems was also discussed. After the presentation by the facilitator, each student was given 30 minutes to make a presentation on his or her work on the ‘messy problem’ (the second assignment). The students were given an opportunity to grade each other based on the presentations and how well they thought their colleagues succeeded in answering questions. Feedback from the students after this session indicated a great level of understanding and satisfaction. There was no discussion

about Information Systems and the students were given an additional reading on the work of Klein and Hirschheim (1994). Their third assignment required them to argue the merits or otherwise of designing an information system using critical systems thinking.

Session four: the use of GSS and Toulmin et al.'s schema of reasoning

This was the last session. Here the students brought together all their knowledge about systems, systems thinking, critical systems thinking, problem structuring methods, decision making and ethics as well as information systems design ideals. They were to use all their knowledge and

reflect on their individual claims about the Mozambique flood disaster situation. The requirement was that they submit their cherished individual claims to the rest of the group for an argument in accordance with Toulmin *et al.*'s schema of reasoning and then come up with a 'consensus claim' of the group. They did this through an electronic meeting in a Group Decision Room (GDR) facility at the CSIR. The software used in the GDR was GroupSystems, a well-known GSS (although not yet well explored in South Africa) which was originally developed at the University of Arizona in the USA. Standard preparations (see Nunamaker *et al.* (1991), De Vreede *et al.* (2000)) in conducting this kind of electronic meeting were followed, except that we were not interested in measuring any aspect of the group's behaviour. Our interest was rather on the justification process followed by the group, based on their broad understanding explained in the sessions above. In other words, our interest was more on the "thinking" and the "sense-making" of the group *prior* to the use of the GSS. We wanted to make some observations as to *whether* and *how* the group engages in a critical reflection based on this "thinking" as they use the GSS software to support them in the justification process. The results of this session constitutes the data for the first case study from GSS use which we present in the next section.

5.7 Data from the first case study - text from GSS use

The technical setup of the Group Decision Room together with the functioning of the GroupSystems software were briefly explained to the group. The agenda of the meeting had been distributed beforehand and was displayed just to refresh the participants' minds. The group used their individual claims from the first assignment, typed them into the categorizer facility of GroupSystems following Toulmin *et al.*'s schema of reasoning. Each participant entered the

entire argument; namely, the claim, grounds, warrant, backing, modal qualifiers and possible rebuttals before submitting to the rest of the group. The submissions were such that the participants identified themselves. The text presented in section 5.12 is a complete un-edited transcript of the GSS session. The facilitator mainly served as a time keeper and observed the intensity of their arguments as they converged towards a consensus claim. Each student was asked to give a written assessment of the learning experience and the GSS software at the end of the session. The assessment statements are interpreted separately and do not form part of the 'strips' discussed below.

Like Trauth and Jessup (2000), we borrow from Agar's (1986) language on the concept of a *strip*. We present the transcripts of the GSS discussions as strips. A strip is a meaningful unit of discourse. It can either be a single statement or several people's comments about a single idea. It can also be an observable act, an interview, an experiment, a document, a comment, or any other bounded phenomenon against which the researcher tests his or her understanding (Trauth and Jessup, 2000). For this case study, the strips are categorized according to the *participants' lines of argument* in accordance with Toulmin *et al.*'s schema of reasoning. For example strip1-1 contains mostly the first participant's line of argument in support of his or her claim. On the basis of the first participant's lines of argument, other participants, also based on their own understanding, engage in a dialogue with the first participant and the group as a whole. The strips were only categorized but not edited, except for reasons of anonymity. This is

to allow the reader to have a feel of the original text (authenticity). The strips are presented next.

Strip 1-1

Claim: Mozambique's dependent and unsophisticated socio-economic infrastructure contributed to the fact that they would not have been able to deal with the flood situation without international help. {#14}

Ground: Mozambique is officially labeled one of the poorest countries in the world, and the country most dependent on foreign loans. {#17}

Warrant: Very few countries have the resources to face a disaster without some degree of international assistance {#19}

Backing: Based on the way that national disasters are dealt with in other countries {#20}

Modal qualifier: So, possibly {#21}

Rebuttal: Unless they could have coped themselves and their pleas for help were just in order to settle the situation more speedily {#22}

They could have handled the disaster, but the consequences would just have been more severe {#16}

Good claim - I agree. Do you think other countries were to blame for not responding fast enough? {#25}

I think we could join this claim and XX's claim to read something like "they could not help themselves without international help, but international help was slow" {#47}

Yes it sort of makes sense to join them but it is two separate claims that are linked. Are we allowed to have a sort of double barreled claim like this? {#57}

I think we can. It is still will claim.... with two sections.... {#62}

The war contributed to the socio-econ situation but did not disable the country to respond themselves. Instead I think it brought some of their factions closer together. {#68}

No they are both to blame. Comms/logistics and locality is more of an issue. SA could have reacted immediately and much more effective should funding be quicker. The other countries more got involved with the effects of the disaster than the actual disaster support situation. {#44}

Was it a plea for help or was it a humanity response from other countries? {#26}

Strip 1-2

Claim: The systems found in the Mozambique situation fits the USH systems theory.

Grounds: The Mozambique situation as deduced from the INGC Situation report and other reports on the floods, is typical of a Containing system as explained in USH.

Warrant: {#15}

What about the moment and time of total disintegration during the flood situation - It was about survival and no other system were thought about or even considered - e.g. education, medical, etc. {#48}

for a period in time the system were non-existing e.g. chaos. Only after chaos the system revert back to its normal state of equilibrium - it may be a total other system that resulted from that. Thus I do not perceive it as an example of USH {#31}

I do not agree with this. According to them, they were in equilibrium. Everything were working fine for them. From our view points it might not look like that, but we are not in the system... {#40}

I think it is a good case study for USH (you can define any situation as a system, and USH is supposed to be universal), but so are many other systems. So the claim is a bit like stating the obvious? {#39}

According to other reports on the Web, other systems went on. The floods were only in some provinces. {#50}

This is too vague to form part of the claim, lets cut it out. {#60}

Strip 1-3

Claim: Previous wars contributed negatively to the overall influence of the flood disaster in Mozambique.

Grounds: The flood water dislodged land mines used for military purposes from marked areas and moved them to unmarked areas. This caused medical problems when people move across these unmarked areas, which in turn had a negative influence on the medical situation of Mozambique, which in turn had a negative influence on the monetary funds.

Warrants: The flood disaster caused huge expenses. This was due to money spend on saving flood survivors, provide food and housing to homeless, etc. The extra burden of medical expenses to be paid for land mine victims increased these expenses.

Backing: The web sites visited states all of the above information and is provided by high sought organizations.

Modal Qualifier:
Rebuttal: {#18}

No, what would have been the excuse if the same happened in the Netherlands where there was no war? {#51}

No, it is two separate claims and the first claim indicated that the people themselves was not and are not able to handle the situation themselves without outside interference which I disagree totally. {#35}

I agree with the claim - had the civil war not occurred Mozambique would have been more economically stable and thus able to react faster to the situation and help itself. {#30}

Can we not group together my claim (TTT's) with this one? It is because of the wars etc. that their infrastructure was bad and that they were too poor to cope by themselves. {#32}

Why do you disagree that they can't help themselves without outside interference.....? {#37}

Even before the wars they would not have been able to help themselves {#38}

That is true. The wars just incremented to overall influence of the floods (land mines moving.....) {#42}

37, I agree that they would have recovered by themselves, but they were actually in a really dependent situation. Much bigger parts of their population would have been wiped out if not for intervention (and a person can't recover from dying,) Maybe I must revise my claim to say that they were very dependent on international aid (TTT).{#46}

I have a new claim combination...

"Mozambique needed international intervention because of their underdeveloped socio-economic structure. The best country to support need was SA but this can only be done with the channelling of international funds through SA to help with the relief....." {#58}

let's refine it then... {#69}

I like what 58 is saying. {#61}

I think 58 needs some minor refinement and then it is a good suggestion for a joint claim. {#66}

This is an excellent combination of the claims, lets find common grounds for it. {#67}

Could work... {#70}

Strip 1-4

South Africa does have the best ability to support disasters in the SADAC region with its locality and infrastructure ability and capability to mobilize relief. {#11}

52 - do not agree with all their money and planes they could only respond seven days later to handle the after-effects of the disaster. {#54}

SA would not be able to support SADAC disasters without international funding, specially on the MZ level. However as the leading country in the region and its position and infrastructure it still stays the best to establish such a structure in SA with international funding. (or should US/EU establish such a facility in Zim?) {#41}

I totally agree... Read what I (ZZZ) had to say in the last part of my claim... {#63}

so presumably SA is in the best position to support Mozambique during the flood disaster {#12}

unless SA does not have the financial backing if international funding {#13}

Don't you think that the claim is then not valid that SA is the best to support disasters in SADAC region if we do not have the money. Wouldn't it be more feasible to say that countries such as the USA are the best for this job, having the infrastructure and the money... SA normally uses all it's funds to help other but with negative influences on our infrastructure (like the grounding of our ORYX helicopters because no money for fuel or servicing). {#29}

SA was the most willing to help and proximity enabled us to respond faster. But I agree with 29, we did more in Mozambique than we were actually able to afford. If we were to be a channel for international aid, that would have been different. {#36}

I totally agree with 36... If SA would have got funding to help Mozambique, we could have done much more much faster without cutting our own throats.. {#49}

Sure, proximity counts slightly in South Africa's favour, but US and UK have vast funds. With air travel (one example is US sending a fleet of C-17's with millions of \$ worth of supplies) it is also quite possible for countries far away to provide assistance. SA could however have done more to help with rescue operations though. {#52}

Strip 1-5

Claim: Although assistance was sluggish in coming through, this was not because of bad intentions on the part of other countries, but rather a result of bad communication. The attitude of those assisting was right, but the inherent logistics were lacking.

Grounds: Countries were willing to offer assistance. At a conference in Rome, countries pledged more than 452 million dollars in assistance to Mozambique.

Warrant: If a country wishes to be perceived as benevolent and willing to help it must offer generous assistance to another country in need.

Backing: Countries should try and be benevolent to other countries in need

Modality: It appears that....

Rebuttal: Unless the countries were deliberately slow in trying to help Mozambique and used the issue of poor communication and logistics as a smoke screen {#23}

I is very funny that EU/US do a lot of talking and promises but is fairly slow in their delivery. {#55}

That's true {#65}

Why do you say that the communication was bad? {#24}

Response time was slow - it was claimed that enough was known about the magnitude and location of the disaster for assistance to be fast {#27}

I agree with the rebuttal more than with the claim. If we in SA knew about the situation (we are part of an international news network), and official pleas were made internationally for help, why did the countries not respond faster? {#28}

Why do you think were the response time so slow? why would other countries be sluggish in to help if they did have the money? Could it be they thought Mozambique could try to help themselves first...! {#33}

No - {#34}

No -they just took time to wake up to the fact that something was going wrong. Standard mechanisms (i.e. logistics support) were not in place to facilitate the process of lending assistance. Other countries were willing to help, they just weren't sure how to go about it. {#43}

Other countries may not have realised help was required. No country assisted Europe with their mud slides and towns being devastated. Outside assistance was not expected. {#45}

But Europe does have enough money... {#53}

I do not buy the argument that a country like America is not able to respond faster. They have some of the best logistics support systems in the world! {#56}

It's not funny that US/EU do a lot of talking - its tragic.... {#59}

Are you saying US wanted people to die? They did not help because they were not fully aware of it.... {#64}

I don't think they want people to die, they are just very self-centred. They will do things for their own interest first, and what is their interest in Mozambique? {#71}

Strip 1-6: whole group

Consensus Claim through system

I have a new claim combination...

"Mozambique needed international intervention because of their underdeveloped socio-economic structure. The best country to support need was SA but this can only be done with the channelling of international funds through SA to help with the relief....." {#73}

Backing: We are all humans and the total world screams in support of their social ethical responsibility towards disadvantages and suffering people {#97}

Backing: People tend to support other people thus {#99}

Mozambique's dependent and unsophisticated socio-economic infrastructure contributed to the fact that they would not have been able to deal with the flood situation without international help. This international help can be supplied by SA's infrastructure but international relief funds should be channelled through SA to help. {#74}

Grounds:?????? {#75}

Warrants:?????? {#76}

Beautiful claim - I go with it. Anyone disagree? {#77}

Backing:?????? {#78}

Modal Qualifier:?????? {#79}

Rebuttal:?????? {#80}

Warrant: For a country to help itself in times of disaster it must have a developed infrastructure. Countries with developed infrastructure and sufficient funds can help countries in need. {#81}

Backing: Based on the statistics/history from previous national disasters {#100}

Warrant: If they gave the infrastructure, but not the funds, and they are the best to do the job, funds should be provided by those who have the funds but is not the best provide the help. {#83}

Put 81 and 83 together... {#88}

Grounds: Because of war, Mozambique was poorly developed. South Africa had the means to help but needed funds to further assist Mozambique. {#82}

Grounds: The rains and storms, hurricanes over Mozambique caused floods resulting in problems for the country. {#84}

Grounds (1st part of claim) : Mozambique is one of the poorest countries in the world and officially the one most dependent on foreign aid. {#93}

Modal: Which leads us to think.. {#85}

Rebuttal: Couldn't a country with the funds and the infrastructure that is far away perform the same role? {#86}

Warrant: I vote for 81 {#87}

Rebuttal: Mozambique might have been able to help itself if they tried hard enough. Other countries did not really have enough resources to help Mozambique. {#89}

I like 81 - hey its mine. {#90}

Rebuttal: Why should funds be channelled through South Africa? Why not straight to Mozambique? {#91}

They do not have the infrastructure to supply the needs... {#92}

rebuttal: Why should other countries have to help, surely they need not if they don't want to? {#94}

That is very true..... {#95}

We are lacking Backing//// {#96}

Backing: Countries will try to help other countries in need? {#98}

Backing: Countries will at some point in time be subjected to natural disasters? {#101}

Strip 1-7: whole group

Consensus through verbal interaction

Claim: Mozambique's dependent and unsophisticated socio-economic infrastructure contributed to the fact that they would not have been able to deal with the flood situation effectively without international help. This international help can be supplied by SA's infrastructure but international relief funds should be channelled through SA to help. {#103}

Warrant: For a country to help itself in times of disaster it must have a developed infrastructure. Countries with developed infrastructure and sufficient funds can help countries in need, and if they gave the infrastructure, but not the funds, and they are the best to do the job, funds should be provided by those who have the funds but is not the best provide the help. {#104}

Backing: Based on the statistics/history from previous national disasters {#105}

Grounds: Mozambique is poorly developed: they are one of the poorest countries in the world and officially the one most dependent on foreign aid. South Africa is one of the most feasible countries to assist them and to channel relief funds. {#108}

Modal qualification: Which leads us to think.. {#109}

Possible Rebuttal: Mozambique might have been able to help itself if they tried hard enough. Other countries might not really have enough resources to help Mozambique and why should they have to help if they don't want to? {#110}

5.8 *Thick description of the second case study on GSS use*

The content of this case study is structurally similar to the first one, except that it was conducted a year later with a different group of students. Once again the group consisted of five Master of Commerce students. It was a coincidence that the same number of students were involved. They were a different group of students. The learning programme was the same as the previous one. The main difference is that the first assignment was based on a claim made by the lecturer. The claim made was that *the National Qualifications Framework (NQF) of the South African Qualifications Authority (SAQA) is a good example of the USH put to practice*. The students were asked to either agree with this claim or construct a counter claim in disagreement and to present their argument(s) using Toulmin *et al.*'s schema of reasoning. Additional reading on the NQF and SAQA was given to the students. In their ten page first assignment on this topic, none of the students constructed a counter claim.

The GSS meeting was held on 26 October 2001 using the Group Decision Room (GDR) at the CSIR as in the first case study. The students were asked that based on the merits of their individual arguments presented in assignment 1, they, as a group had to present "a group agreement" or "a group disagreement" with the claim. The co-facilitator was one of the previous years' students who was familiar with the GDR setup. Because the claim was given in advance, all they had to do was to enter it into categorizer of GroupSystems, followed by their arguments based on grounds, warrants, backings, modal qualifications, and possible rebuttals (Toulmin *et al.*'s schema). *The facilitators gave no further instructions on the sequence of the meeting. This was deliberately done in order to allow the students to discover some of the underlying design assumptions of the GSS tool (which they did with some accompanying frustrations!) and to see if they would, based on their exposure to critical systems thinking, on their own, structure their arguments in a systematic way while using the tool.* As part of an evaluation of the session and the GSS software, they were also asked to make additional claims on the GSS session or the software and to support their claims using Toulmin *et al.*'s schema of reasoning. The

group used both the GSS tool and verbal discussions to reach “consensus”. In addition, each student completed an evaluation questionnaire at the end of the session. The claims on the sessions and the evaluation questionnaires are discussed and interpreted separately from the strips. The data from the GSS use session is next presented.

5.9 Data from the second case study - text from GSS use

Like in the first case study, we present the transcripts of the GSS discussion session in the form of *strips*. However, unlike in the first case study, here the *strips* are categorised according to the elements of Toulmin *et al.*'s schema of reasoning. This means, for example, that the grounds from all the participants are grouped together, the backings together *etc.* This is because although the group was at liberty to identify themselves and own their lines of arguments as in the first case study, they did not do so. The result was that the whole session was held under anonymity and less process structuring - the only meeting structure being the elements of Toulmin *et al.*'s schema. We anticipated that these two forms of categorising the strips would enriched our interpretation of the GSS sessions and thus enhance our understanding of GSS use in decision justification environments, although we could not tell in advance what form of enhancement in our understanding would emerge.

Strip 2-1

Claim: The NQF of SAQA is a good example of USH put to practice.

The literature reviewed indicates that the NQF is a good example of the USH. it can be shown diagrammatically to contain systems within a containing system with inflow and outflow into the containing and the other systems and it exists within an environment of other related systems
 {#47}

Strip 2-2

Grounds:

Principle of Interaction {#9}

Principle of Cohesion {#10}

Principle of Connected Variety {#11}

Principle of Limited Variety {#12}

Principle of Preferred Patterns {#13}

Has cyclic progression {#14}

Principle of Cyclical Progression {#15}

Please add additional detail for your principles {#16}

USH seeks to establish certain principles, which apply to all systems {#17}

principles already mentioned by another participant can be used to conceptualise a system and thus produce grounds for the claim made {#20}

Would you say that the NQF is an example of the USH? because of the relationship between the elements, their qualities or their positional value in the system?? {#21}

There is a hierarchical approach to the way in which NQF is structured, thus forming a part of the GENERAL SYSTEMS VIEW. {#22}

The NQF system as defined shows various good examples of all the USH principles {#23}

Not serious in making #23 a grounds are you ??? {#24}

#23 resembles a claim ! {#25}

#22 resembles a warrant {#27}

NQF displays all the characteristics of the USH principles from General systems view till cyclic progression. It encompasses all the systems methodology that we know of. It views all the components of the NQF as subsystems, thereby allowing for the main(NQF) to function as a whole. Thus the whole is greater than the sum of its parts {#31}

NQF is a social construct - general system thinking. It will continue to be negotiated for people by people. It is a life long learning system which brings together from a variety of South Africans with different socio-economic backgrounds, representing a variety of worldviews - critical thinking {#36}

#31 is a Claim {#37}

Response to #16 - No.... Refer to USH itself - No need to retype the whole thing - First Principle Argument will only stiffen discussion {#40}

#25 The grounds will always resemble be "a claim" otherwise it would not need a warrant and backing {#42}

Refer #42 - No... Not true. Grounds stand by themselves (by Definition) {#49}

Disagree with point no 40 - I understand that you need to add the detail of why and how the systems principles apply to the NQF to get to a point of agreeing or disagreeing on the claim!! {#51}

agree with point 49 - grounds are the foundation of the claim which is why detail needs to be motivated {#53}

#31 is a basis for the claim, there are many subsystems/mini programmes in the NQF system. If describing the NQF according to the general systems view, one can say that an environment exists(that is the SA education) there are boundaries(politics and levels of education) as well as a fixed hierarchy (there is a fixed progression in the way the process works). {#55}

Basis for a Claim = Warrant !! {#60}

NQF can be described as making the democratisation of the learning process in SA. It aims to make one system for education {#72}

Yet another Claim ? {#74}

The grounds for this is that the process before was not very stable and different systems, this would make the process a "standardised" one, therefore the grounds for the NQF to be classified within USH is that there should be systems view point {#76}

agree that it is based on the principles of USH {#99}

I agree on #9, #10, #11, #12, #13 and #15 {#100}

Recent input in this point went around what is a ground rather than what is the ground in this situation. The ground should be that the principles listed in various inputs in this section are the characteristics of USH and the NQF exhibit these characteristics - therefore agree with pt 99 {#101}

USH principles allow us to distinguish that the NQF can be described as a system! {#102}

Can someone write one single clear ground, please... {#106}

106 Check the consensus box {#110}

Let me try..... Grounds may be the Six Principles of the USH as listed in the beginning #9, #10, #11, #12, #13 and #15. Shall we use these ? {#112}

Agree {#114}

These are the underlying principles I think each of us used to come to the conclusion that the NQF is a system, {#119}, so can we please agree on this {#120}

Strip 2-3

Warrants

The warrants indicate that the characteristics of the NQF are similar to the characteristics of the USH which are also common to other systems thinking characteristics {#28}

Practical examples of the USH principles in the system under investigation normally means that the USH principles can be applied to that system. {#35}

Grounds #9 - The functions of the ETQA {#29}

Grounds #10 - Ask me {#32}

The NQF separates itself in to three parts: 1. Setting of standards; 2: the design, delivery and assessment thereof, 3: quality assurance process. Thus smaller parts working together for the benefit of the whole {#39}

#39 should be listed under grounds(?) agree with the warrant in #35 {#50}

point 39 summarises the warrants of the NQF well - therefore disagree with point 50 - warrants justify the move from the grounds to the claim {#57}

#39 summarises the warrant for the claim, cannot be placed under grounds because this a the way in which it functions, grounds would be the actual proof or circumstances about the claim {#59}

Warrant ?? {#65}

NQF provides us with a basis for systematic change: a system that challenges the number of assumptions that exist in respect to how an education system works, a system with an opportunity to grow and develop in new ways! {#88}

Yet another Claim ? {#90}

warrant for a claim that the NQF forms part of the USH principles {#92}

That is not the Claim..... The claim is that the NQF is good example of USH put to use.... Read it... Not that NQF forms part... ? {#94}

agree on #92 {#95}

Shall we Vote / Fight ?? {#96}

#92, u are correct,that it what I meant {#98}

the proposed warrant it that it is academically accepted to apply a theory to a structure such as the NQF - a theory which in this cases is accepted. {#105}

What ? {#108}

Strip 2-4

Backing

Warrant #29 - Government Gazette No19231 {#34}

There are no legal principles or laws of science involved in this environment - there cannot be a true scientific experiment performed - so the interpretation needs to be based on the available literature and authors interpretation. {#41}

The transformation and evolving of the system - as discussed by Kraak - and supported by the principles in Gasparski, is applicable to the NQF {#43}

Is #41 a claim or a backing ? {#44}

Response to #43 - Kraak and Gasparski presented as Backing or Claimed to be applicable ? {#46} aren't the principles as explained by Hitchens and Shrivenham the backing as well {#52}

Backing is reference material applicable to the mechanisms of the NQF {#54}

Hitchens and Shrivenham would go down as Grounds (Principles) {#56}

With reference to point 44 - the backing is supposed to confirm if the claim is a safe move to make - it should reference applicable laws of science or principles accepted in a profession e.g. accounting or law - in this case there are no strict rules to apply... {#61}

Shouldn't principles be placed under warrants? {#64}

No... Principles are Grounds.... Warrants is the essence of the Argument {#70}

With reference to pt 64 - according to Toulmin - warrants cannot be taken on trust - they can either be accepted based on research data - or rules (accepted principles within the profession in which the debate takes place) that forms the backing to accepting the warrants {#97}

Proposed backing is that the claim can be accepted based on the literature study and understanding by the group of the literature and the principles involved in the USH and the NQF {#111}

Strip 2-5

Modal qualifier

"Currently" {#18}

Presumably {#26}

Appears so - reason being it is one person's perception as indicated in the article by Kraak - and there is not empirical research to prove this {#33}

33 did we look for cases of empirical research? there should be some evidence {#58}

With reference to point 58 - I was not aware of empirical research in the literature which is why Hitchins and Shrivvenham maintain it is still a hypothesis. {#63}

#63 - is that where critical thinking comes into the picture? {#68}

What is the critical thinking you are referring to in pt 68 - or do you mean that we need to take leaps in interpretation and application of the theory to accept or reject the claim or that we need to broaden the perspective on the issue? {#116}

No {#117}

critical thinking indicates that there can be no fixed rules and procedures. Some things will always be hypothesis, because of continuous change {#129}

Strip 2-6

Rebuttal

A "wider" interpretation of the grounds than that which is encompassed using a more "narrow" interpretation {#19}

Unless the viewpoint of investigation of the NQF system or the definition changes and some of the USH principles are discovered as not present in the NQF system. {#30}

The support of the claim is based on presently available work and literature study - additional work and literature which reflects different points of view could change this - without data it all depends on different peoples perceptions and opinions which in turn reflect their life experiences. {#38}

Most people feel that the NQF is only about a change in the learning programme development that is to reform the teaching process. This is evident in that all forms of teaching and learning is now being based on the curriculum 2005, which according to most people will not work in our country {#45}

If the claim in #45 is to be interpreted, it means that the major stumbling block in the NQF's progress because, people are interpreting it as a programme instead of a FRAMEWORK! {#48}

if the same standards are not applied throughout the whole NQF system the credibility and integrity of the whole system could be in jeopardy {#62}

point 62 - this is looking at the effectiveness of the system - not whether it is a system or not? It can still be a system even if the standards are not applied - it will maybe not be a stable system {#66}

that is the reason the NQF exists :TO SET STANDARDS {#67}

#66 I agree, it can still function as a system {#73}

Place it in Consensus..... {#75}

*Strip 2-7: all elements of the schema***Consensus reached through system**

In all the comments made there do not seem to be any that refute the claim - they all seem to provide information of why the NQF is a good example of USH although I would expect better and more detailed arguments to support this. {#69}

Arguments is Warrants.....Pre Typed & Available {#71}

Any disagreement to point 699 - please submit urgently {#77}

Point 699 ??? {#78}

Do we need a single ground, warrant and backing? {#79}

sorry I intended to type point 69 {#80}

Response #79 - No certainly not.... Each claim can have it's own..... {#81}

Agree ??? {#82}

yes {#83}

Backing: the principles described by Hitchins&Shrivenham indicate that when present in any system, that system qualifies as a system(warrant). because NQF of SAQA has the following characteristics of a system (input, boundaries,output, goals, purposes, function within an environment under certain external constraints) we can conclude that IF these characteristics are correctly identified AND comply to all the prescriptions AND same standards are applied across the system(modality) then NQF of SAQA is a good example of USH put to practice, ELSE (rebuttal) integrity and credibility of whole system is placed in jeopardy {#84}

Thank you.... Place it in Consensus {#85}

in reply to point 79 I understand that the consensus is supposed to indicate if the comments on all of grounds warrants and backing is along one line of argument or there is debate - I do not see any debate in this dialogue there appears to be consensus {#86}

What ? {#87}

The value and merits of the system and how it operates is a separate discussion - the conclusion in this exercise should be that using Toulmin's schema of reasoning - the NQF of SAQA is a good example of the Unified Systems Hypothesis - does this go any further to help support the hypothesis?? what more needs to be done to accept the hypothesis?? {#89}

#84 sounds good to me.... {#91}

thank you #91 {#93}

Grounds: NQF of SAQA has the following qualifying characteristics of a system input, boundaries, output, goals, purposes, function within an environment under certain external constraints {#103}

Agree with #103 {#104}

Agree with 103 {#107}

Backing: the principles described by Hitchens&Shrivenham {#109}

Warrant: principles should be present in a system to qualify as a system {#113}

agree with 109 and 113 {#115}

I am getting extremely frustrated - I do feel there is consensus on all these issues and this topic should now be closed - I am signing off {#118}

Sjeesh..... {#121}

I make the sound of one hand clapping.... {#122}

consensus reached for me is that there is a NQF is a system , this can be justified by using the USH principles as a basis for this argument. {#123}

what is the definition of consensus - do we really have to spell it out!!!!!! We agree!!!!!! {#124}

Not agree, just had your say.... {#125}

yes we do {#126}

pt 125 why do you say we do not agree - we are all saying the information in all the sections support the claim what more do we have to do??? {#127}

why don't u agree? {#128}

Time out please - can we try a new simple topic please!! {#130}

Consensus reached through verbal discussion

Grounds - The principles of USH are the grounds {#135}

Warrant - If these principles are present in any system and appropriately applied then the system qualifies as a system {#137}

Backing - based on the literature of systems theory ,USH and NQF {#136}

Modality - Currently appears to {#138}

Rebuttals - Based on a wider interpretation of the grounds than that which is encompassed using a more narrow interpretation {#139}

That there is not enough clarity on Toulmin's scheme particularly on the warrants. I however feel that the purpose of this meeting is to explore and understand the GSS system and not redebate Toulmin and the NQF as a USH - that was the topic for the 1st assignment. If we applied the GSS to a more appropriate type of meeting - e.g. to brainstorm the topics that should be in a future Informatics Masters course, there would be a more positive perspective on GSS. {#134}

5.10 Setting the scene for the use of the analysis framework

We have already presented detailed illustrations in section 4.2.3 of chapter 4 on how the analysis framework would be used to interpret the data from GSS use. While the strips as presented above would serve as organised units for analysis, we will also follow Gopal and Prasad's (2000) advice to look at the entire *project* of GSS use. In this case the project is the learning programme of the students as a result of which the data presented was produced. The architectures of Figures 4.3, 4.13 and 4.14 as respectively explained in chapter 4 on the alternative hermeneutic circle, thinkLets and Symbolic Interaction would be deployed in the data analysis process.

5.11 Conclusion on Part II

This part contains an extensive amount of data which is organized in a way that would enable us to deploy the five analysis schemes presented in chapter 4. Trauth and Jessup (2000) point out that what is necessary but not sufficient for reliability of interpretive research is that detailed documentation of procedures be provided. They go on to say that what is also necessary is to employ methods that can demonstrate how the interpretation is consistent with the data. According to these authors, this occurs in interpretive research when the reader, after having read the researcher's account of the process, would be able to see how the interpretation is meaningful rather than simply made up. They indicate that this is done by walking the reader through the process of developing the interpretation.

We have presented in this part the data on GSS use whose understanding we will seek through the use of the analysis framework. In the main, a better understanding of the data presented in this part will enable us to address the second leg of our research purpose. We trust that the data we have presented in this part, together with the description of the

process we have followed in arriving at it will enable the reader to walk with us as we engage in the analysis process in Part III.

Part III: Interpretation of Results

5.12 Introduction

In this part we put to use the multi-theoretic Analysis Framework presented in chapters 3 and 4 together with its respective subsystems depicted in Figures 4.4, 4.5, 4.11, 4.13 and 4.14 of chapter 4. We call these subsystems *Framework Schemes* and the sequence of their application is summarized in Table 5.2. Framework Schemes I-III are used to interpret the questionnaire generated text while Framework Schemes IV and V aim at making sense of the GSS session text. Each Framework Scheme is used as a lens to “look through” each of the eight questions of the Consolidated Morphological Fields in Table 5.1. The use of Morphological Graphs was found to be more helpful in giving a quick “bird’s eye view” of the data on the basis of which further interpretation is made.

From these consolidated results, the relevant theories within the respective Framework Schemes are used for further illumination, corroborated with specific text excerpts from Table 5.0 where appropriate and necessary.

Interpreting the questionnaire text

In order to keep the analysis as a coherent whole, we found it instructive to introduce a new terminology together with an additional procedural outline. The outline is an extension of Table 5.2 (previously Table 4.2) and includes the overall interpretations of the text from each Framework Scheme across each question. We call these overall interpretations *grids of interpretations*. These interpretations could be at any of our interpretive levels, whether *systemic*, *interpretive* or *hermeneutic* as described earlier.

Table 5.2: Framework Schemes at a glance (previously Table 4.2)

	Systemic - Interpretive - Hermeneutic levels				
	Framework Scheme I	Framework Scheme II	Framework Scheme III	Framework Scheme IV	Framework Scheme V
Decision Justification Environment (Context)	Toulmin <i>et al.</i> 's schema of reasoning	Toulmin <i>et al.</i> 's schema of reasoning	Toulmin <i>et al.</i> 's schema of reasoning Courtney's new decision-making paradigm for DSS	Toulmin <i>et al.</i> 's schema of reasoning Briggs <i>et al.</i> 's thinkLets for GSS research	Toulmin <i>et al.</i> 's schema of reasoning Gopal and Prasad's focus on Symbolic interaction for GSS
Decision-making Group ("text")	Giddens Orlikowski Poole <i>et al.</i> without technology	Giddens Orlikowski Poole <i>et al.</i> with technology	Giddens Orlikowski Poole <i>et al.</i> with technology	Giddens Orlikowski Poole <i>et al.</i> with technology	Giddens Orlikowski Poole <i>et al.</i> with technology

They are the interpretive outcomes of applying the respective Framework Schemes to the text. The grids are given distinguishing labels in accordance with their corresponding Framework Schemes and questions. For instance GFSI-Q1 is the label for a *grid of interpretations* resulting from applying Framework Scheme I on question 1. The outline is shown in Table 5.3. This outline is a procedural construct and we leave out the details of the grids themselves to a later stage when all the interpretations would have been made. When completed, the outline would have produced thirty-eight grids of interpretations, with twenty-four from questionnaire text and fourteen from GSS use text.

Table 5.3: Grids of interpretations labels

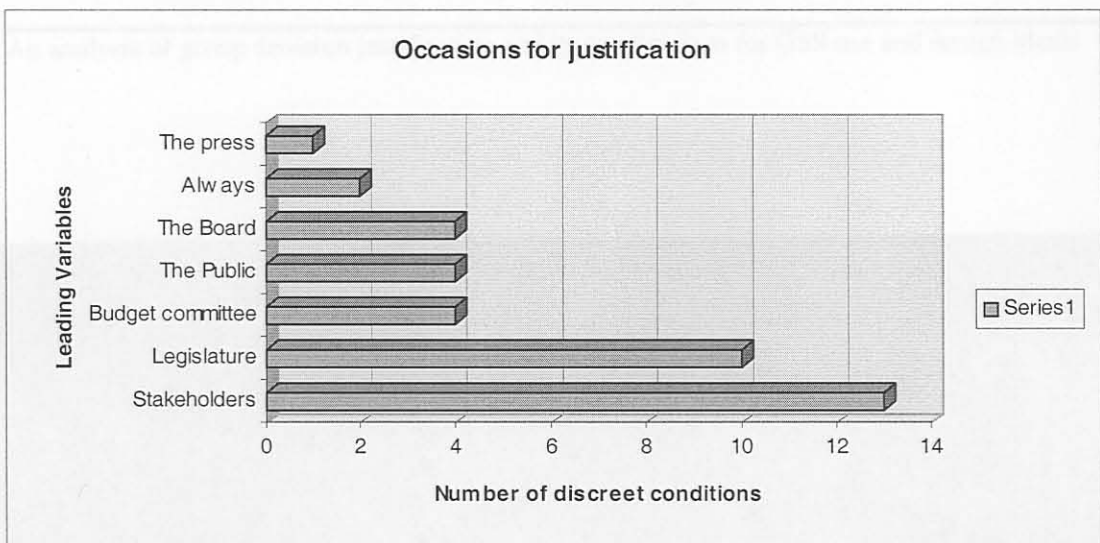
Framework Scheme	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
I	GFSI-Q1	GFSI-Q2	GFSI-Q3	GFSI-Q4	GFSI-Q5	GFSI-Q6	GFSI-Q7	GFSI-Q8
II	GFSII-Q1	GFSII-Q2	GFSII-Q3	GFSII-Q4	GFSII-Q5	GFSII-Q6	GFSII-Q7	GFSII-Q8
III	GFSIII-Q1	GFSIII-Q2	GFSIII-Q3	GFSIII-Q4	GFSIII-Q5	GFSIII-Q6	GFSIII-Q7	GFSIII-Q8
IV & V GSS 1 text	The GSS text is categorized using Agar's concept of a strip. Seven strips are analyzed using Framework Schemes IV and V.							
IV & V GSS 2 text	The GSS strips are categorized in accordance with Toulmin <i>et al.</i> 's schema of reasoning and analyzed using Framework Schemes IV and V. Seven strips are analyzed.							

5.13 Framework Schemes I-III applied to text from the first question

The aim of question 1 was to find out from the key informant representatives of the group if there were occasions when his or her group had to justify its decision to other people. Using a combination of some aspects of Morphological Analysis and Grounded Theory, seven leading variables were identified from the thirty-four responses. The leading variable with most properties or “discreet” conditions are Stakeholders, followed by Legislature. Budget Committee, the Board and the Public are next with equal numbers of discreet conditions. The Always and the Press leading variables have relatively fewer discreet conditions. Graph 1 captures in a nutshell the essence of the responses to the question. In order to further analyze the text (responses), we apply the three Framework schemes, FSI-Q1, FSII-Q1 and FSIII-Q1. The results are three corresponding grids of interpretations; GFSI-Q1, GFSII-Q1 and GFSIII-Q1. We follow this process until all the responses have been analyzed.

GFSI-Q1

In applying FSI-Q1, we start from the Decision Justification Environment (context) to the Decision-making group (text) in our application of Framework Scheme I.



Graph 1: Morphological graph for question 1

Reading the data through Toulmin *et al.*'s schema of reasoning which serves as a basis of the Decision Justification Environment (context), the seven leading variables describes occasions, which, in their varying degrees, establish *contexts* for decision justification. There are therefore numerous context specific occasions for groups to justify their decisions to others. The following excerpts illustrate these contexts:

“There are numerous occasions. For example; explain budget limitations to project managers, justify office expenditures vs. head office organization, explain to local organizations reasons for impossibility to meet their requests for funding, justify overhead costs to recipients for funding.” (Respondent 14)

Respondent 18 captures it thus:

“We often have to justify decisions: to funders in terms of how we have used their money [Via funding reports], to clients during projects, as part of measuring progress [usually during meetings], to ourselves, as we chart the broad direction of the organization and ensure it is in line with our vision/mission [during weekly/annual planning sessions], to our Trustees, in terms of broad vision [during BI-annual meetings]”

While respondent 24 remarks:

“All decisions have to be justified, so on most occasions such justifications/explanations have to be given.”

For respondent 26, it is a matter of common good and public accountability:

“The very nature of the policies that govern the functioning of my organization embodies such values, as transparency, professionalism, equity, fairness, participation and accountability make abundantly clear that we need to justify virtually every decision we make. Starting from budgeting and planning, my organization has to make value choices.

We have to prioritise what we want to spend the limited resources at our disposal on. These choices have to be defended before the budget committee. This is where my department justifies their decisions. We are holding in trust public funds for public or common good, we are therefore not at carte blanche to spend willy-nilly. We are accountable to the public. Through our political head we table our budget speech at the legislature for all sectors to poke holes at it. This provides us with another chance to defend our decisions to the public...”

What we are aiming at is to interpret the significance and potential meanings evoked from the decision-making group (text-analogue) by the decision justification environment (context). It is clear that the contexts just described cannot be separated from the decision-making group itself (the text-analogue). A decision-making group operating within a decision justification context is always enabled or already constrained by the prevailing context. From a structurational point of view, these enablers or constraints are in the form of institutional structures, rules, resources, power and norms. The text-analogue suggests that the *institutional structures* in which the groups operates provide the most occasions for decision justification - for example, the Stakeholders, the Legislature, the Budget Committees and the Board. At the same time *interaction* draws on these institutions to constitute *modalities*, in so doing, reconstituting the institutions. The leading variable of Always suggests a decision justification *norm*, while the Press is a modality through which to reach the ultimate beneficiaries of the justification process, the Public. In other words, one could interpret the leading variables as saying - given that the Stakeholders (the Legislature, the Budget Committee, the Public, the Board and the Press) *expect it*, there are many occasions when a group has to justify its decisions to others. What is also observable here is that the discreet conditions of the Legislature are *normative*. This is not surprising from a South African constitutional perspective alluded to in chapter 2, even though others responded from the perspectives of groups within their own organizations and countries, rather than from a South African perspective.

At the systemic level of the question, two additional observations can be made. The first observation is that while occasions for decision justification do not always presents

themselves in the case of individuals, they seem to in the case of groups. Bacharach *et al.*'s (1995) argument that in organizations, a primary source of this anticipatory anxiety is *accountability* and that underlying every managerial hierarchy in complex organizations is some norm of accountability seem to be well supported by the text-analogue we have presented. The second observation is that considered from Toulmin *et al.*'s schema of reasoning point of view, these occasions take the form of *grounds* for group decision justification. We will return to these observations later in our analysis. Framework Scheme I enables us therefore to assign meanings to the text based on various justification contexts while the text assists us to gain a better understanding of the contexts.

GFSII-Q1

This Framework Scheme is similar to the previous one (FSI-Q1), except that it brings in the technology lens. Respondents 2, 4, 8 and 13 do make reference to information technology. However, their reference is either in terms of the budget for equipment acquisition, infrastructure plans or the governance structure of their organizations. In structural sense, this in line with Orlikowski's (1992) proposal that we consider technology as one kind of structural property of organizations developing and or using technology. According to the text, and in line with Orlikowski's proposal, the technology is an instantiation of some of the rules and resources constituting the structure of an organization. Respondent 13 clearly demonstrate this:

“... To the Director General who is the Executive head of the province, to head of department in which the information technology department resides, to the central information technology committee that function as the official IT governance in the province, to the departmental IT committee - IT governance at provincial departments level.”

All these point to the institutional structure made of various IT Stakeholder groups within a provincial government department, confirming Orlikowski's proposal.

GFSIII-Q1

Looking at the data through the lens of Courtney's (2001) new decision-making paradigm, the leading variables become the bases for the development of multiple perspectives. For instance the following excerpts demonstrate the O perspective:

"Some decisions are based on proposals that are submitted by our partner organizations to fund their projects. When these proposals are declined, it is necessary to give an explanation, especially for key organizations or individuals who occupy important positions." (Respondent 1)

"Our organization is a foreign policy think tank. Besides being answerable to a board, we have a broad constituency in government and civil society as well as regional, continental and international networks. The choices and outcomes of our research activity have to be evaluated by the board and have to have an impressive value to our beneficiaries/constituencies. In this sense, choices of projects (decisions) must be justified in terms of their relevance and utility." (Respondent 28)

"Yes, I always have to explain or justify my decisions to the MEC, the Head of Department, and the Executive Committee of the Provincial Legislature, the National Department of Education, the Trade Unions and the communities served by the Department. When services of redundant teachers are terminated, when over expenditure on personnel occurs, when new posts have to be created, those decisions have to be justified to all stakeholders." (Respondent 3).

"Accountability to parliamentary or legislature structures, public when they enquire, public when there is a change in policy or implementation, internally when policy changes, labour organizations." (Respondent 31)

Respondent 4 on the other hand demonstrates the T perspective:

“The dynamic nature of the IT field warrants explanation of some decisions especially to IT - illiterate persons.”

As we have suggested in chapter 4, application of Figure 4.12 would be helpful here. With decision justification being one of these perspectives, the development of the other perspectives (the T, O, P, Ethics, Aesthetic) is bound to be different. For instance when a group knows in advance that it would have to justify its decision, it can be expected that it would develop a justification T perspective, or a justification O perspective *etc.* in its decision-making process. This means that the group decision-making process itself would be different. In assisting groups with the development of these justification perspectives, Toulmin *et al.*'s schema of reasoning would be valuable. In terms of Courtney's new decision-making paradigm, the *context* in our analysis framework includes the development of multiple perspectives (the process) while the *text* includes the group's perspectives themselves.

5.14 Framework Schemes I-III applied to text from the second question

GFSI-Q2

Question 2 is a follow-up to question 1. Its aim was to find out whether the occasions referred to in question 1 were found to be compelling due to reasonable and satisfactory grounds; or if they were found to deserve no response in some instances.

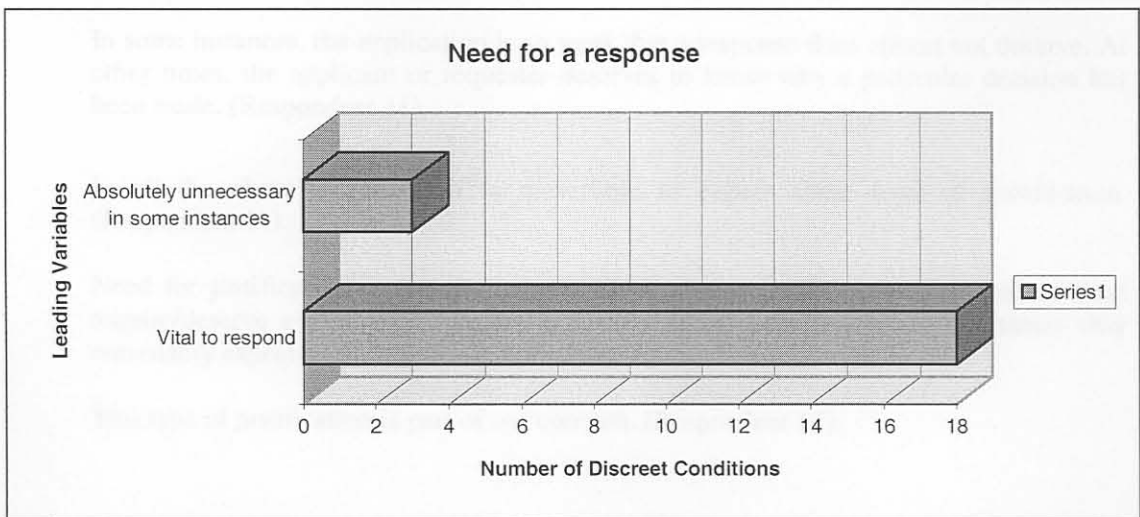
The responses captured in Graph 2 indicate a greater need for a response to the occasions. The 'discreet' conditions taken together better elucidate this need for a response:

Always compelling as they have profound impact on other stakeholders, in most cases compelling, need to explain why justify, share information, to contain perceptions, to satisfy customers, allocated funds, need to be reflective, even those that do not deserve it, it is courteous to respond, deserving, if addressed to office, for good communication, it is part of our jobs, in my organization's own interest, little or no co-operation if failing to justify, always necessary even if stating the obvious, it is reasonable to expect it, when required.

Using Introna’s explanation of interpretation, one can say that the justification occasions are grounded in the in-order-to’s and the for-the-sake-of’s as illustrated by the following respondents:

Yes, for the sake of transparency there are always compelling grounds for explanation/justification. (Respondent 24)

In such occasions, I find them compelling due to the fact that failure to justify means there will be little or no co-operation. (Respondent 12)



Graph 2: Morphological graph for question 2

Very often yes. For the sake of transparency and plain good communication, it is most of the time compelling on satisfactory grounds. Due to ignorance or lack of insight it is sometimes unnecessary and does not need a response. (Respondent 23).

I market my department with every opportunity I get. I see justification of decisions as a way to help others understand what we try to achieve in it. (Respondent 9).

In my organization’s own interest. (Respondent 16).

All queries are treated with utmost urgency. It is not for my department to award marks for queries but it is vital for us to respond. Perceptions, in my view should be well contained in order for any organization to succeed. No query in my department will go

unattended. I am creating a responsive, reiterative and reflective organization whose aim is to satisfy its customers. (Respondent 26).

Necessary to share information and decisions with lower ranking officials. (Respondent 30).

As a statutory body, we are required to consider each query as deserving a response. Most queries stem from a lack of understanding of legislation and SSS policies & procedures, and it is one of the SSS's functions to disseminate such information. (Respondent 20)

When looking at the data through Toulmin *et al's* schema of reasoning, we are able to see the following confirmations, which in various ways, indicate that most groups find compelling grounds to respond:

Even those that don't deserve a response, the organization is courteous to respond. (Respondent 1)

Response always provided, even if simply stating the obvious. (Respondent 2).

I find them compelling because they have a profound impact on other stakeholders in education. (Respondent 3).

In most instances, it is useful and contributes towards a culture of openness. However, where questions are deliberately phrased so as to react negatively to a decision - no additional justification will help. (Respondent 4).

Normally these directly impact budgets and people, therefore take them seriously. (Respondent 8)

In some instances, the application is so weak that a response does almost not deserve. At other times, the applicant or requester deserves to know why a particular decision has been made. (Respondent 11).

In all the above occasions it is reasonable to expect some form of justification. (Respondent 13).

Need for justification/explanation varies. There are occasions/instances, which do not require/deserve a response. On many occasions clients superiors or staff members may reasonably expect explanations. (Respondent 14).

This type of justification is part of our core job. (Respondent 17).

The above are all compelling in principle. Sometimes there is a mismatch between clients/funder expectation and our contractual agreement, and this can lead to problems. (Respondent 18).

In most cases on reasonable and satisfactory grounds. (Respondent 19).

The occasions are usually compelling, but may also not deserve response. (Respondent 21).

Mostly compelling. In very few instances are they deserving of no response. (Respondent 22).

They are reasonable and compelling; i.e. there is a reason behind such an enquiry. (Respondent 25).

To the extent that the central government allocates money to us, there are compelling reasons to justify. On other occasions, I find it absolutely unnecessary. (Respondent 27)

The organization has core analytical competencies for which it enjoys a healthy reputation. There have been occasions when certain projects focuses vs. preferred others had to be justified. This has been the case with government departments and potential donors. If not constructive or suggestive, they will tend to be ignored. (Respondent 28)

Justifications will always have to be made but only when required by circumstances. But, while justifications exist, they need to be explained or even divulged. (Respondent 29)

In almost all cases I feel obliged to respond by providing facts and compelling reasons. (Respondent 32)

Every query deserves a response. If addressed to office, it needs a response. (Respondent 33)

GFSII-Q2

Due to the nature of this question, there is no reference to technology by any respondent for this grid of interpretation. The framework scheme is thus equivalent to the previous one (*FSI-Q2*). Thus, the text generated by question 2 can be said to belong to the decision justification environment (context), which is largely accounted for through the application of Toulmin *et al's* schema of reasoning.

GFSIII-Q2

Sweeping in Courtney's new decision-making paradigm for DSS, one can say that in principle, each respondent sees a problem differently and thus generates a distinct perspective on it. However, one notices that most of the perspectives are O perspectives, although the Ethics perspective as reflected in the following responses can also be seen:

Even those that don't deserve a response, the organization is courteous to respond.
(Respondent 1)

Response always provided, even if simply stating the obvious. (Respondent 2).

Normally these directly impact budgets and people, therefore take them seriously.
(Respondent 8)

5.15 *Framework Schemes I-III applied to text from the third question*

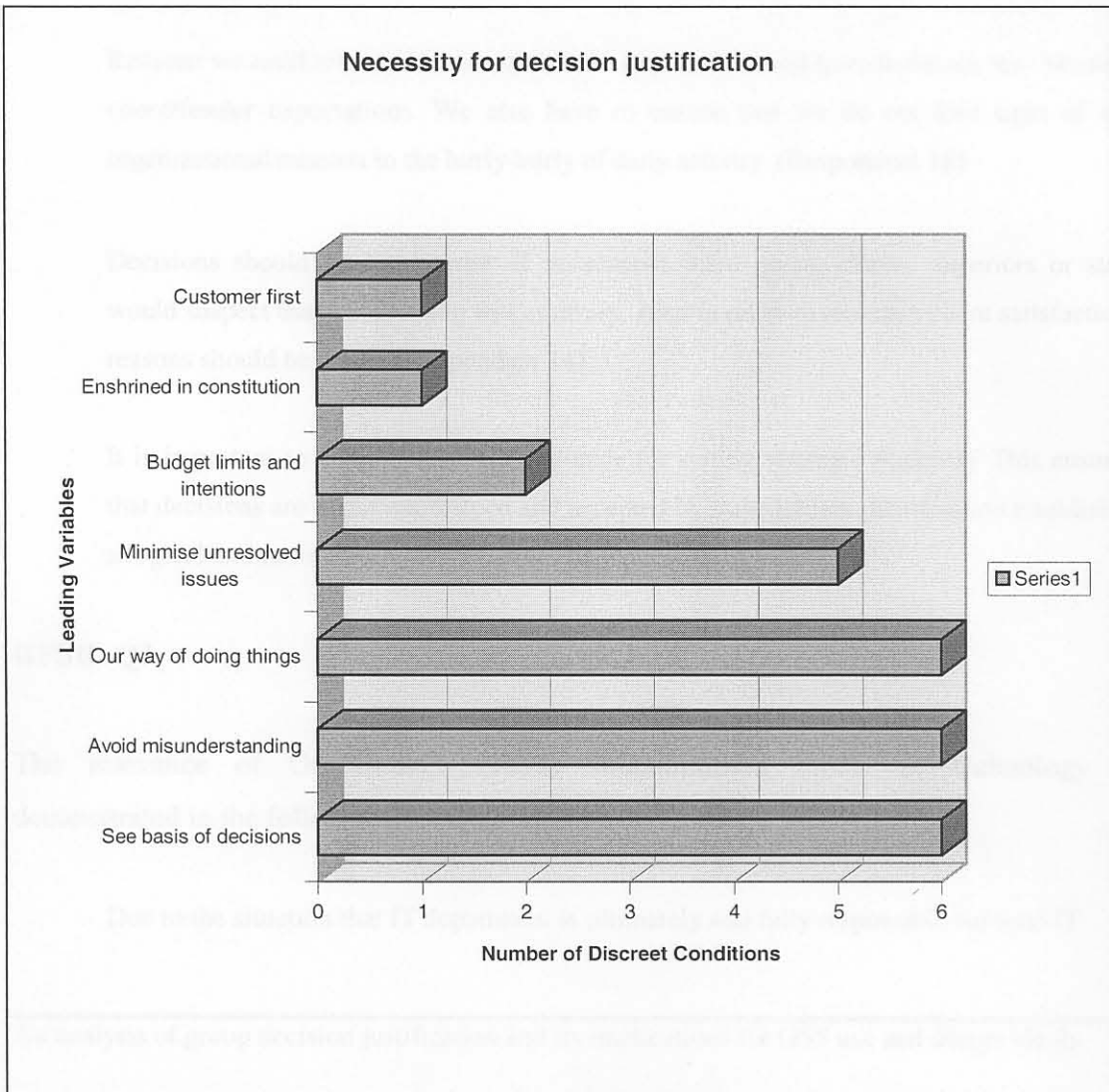
This question captured why the justification of group decisions was necessary. This is perhaps the most important question since it relates directly to the purpose of the study. The Morphological Graph 3 captures the consolidated responses. There are seven leading variables, three of which have the same number of discreet conditions; *our way of doing things*, *Avoid misunderstanding* and *See basis of decisions*. *Minimize unresolved issues* is next with five discreet conditions followed by *Stay within budget and intentions* with two condition. *Enshrined in the constitution* and *Customer first* are last with only one discreet condition. The reader is urged not to loose sight of the fact that in applying the framework schemes, we are interpreting the text within the Decision Justification context in accordance with the analysis framework. Grids of interpretations should therefore not be seen in isolation.

GFSI -Q3

The leading variables, *Our way of doing things*, *Avoid misunderstanding* and *See basis of decisions*, *Minimize unresolved issues* and *Stay within budget and intentions* could be

seen as backing in Toulmin *et al.*'s schema of reasoning; while *Enshrined in the constitution* and *Customer first* could be seen as warrants. Thus, in Toulmin *et al.*'s terminology, one can interpret the results of Graph 3 as saying: - justification of decisions is our ways of doing things. It is done so that people can see the bases of the decision made, in so doing, avoid misunderstanding, minimise unresolved issues and stay within budget and intentions. Furthermore, the need for decision justification is enshrined in the constitution and the principle of customer first.

Through the structurational lens, we see in the leading variables, *norms* as well as *rules and resources*, which enable or constrain group actions. For instance "our way of doing things" which is used as *backing* in Toulmin *et al.*'s schema is a *norm* in Giddens' structuration theory, while "stay within budget and intentions" constitutes *rules and resources* in structurational sense. The warrants (constitution and customer first) translate into structurational *modalities*.



Graph 3: Morphological graph for question 3

The following excerpt from the respondents illustrates institutional properties in a normative structural sense. They constitute organizational structure of legitimation through which the organizational practices and tradition are sustained:

As has been stated in question one, to justify our decisions is not a choice but a way of doing things that is enshrined in the constitution of the country. We are following the model of an entrepreneurial government, which puts the customers first. When one looks

carefully at Batho Pele, one clearly sees that decisions taken by government on behalf of the public must be sufficiently justified to the public. (Respondent 26)

We are a public funded institution. We are a statutory body and our functions are legislated. Criticism is important to ensure we are responsive to the public's needs - justifying decisions is part of this. (Respondent 20)

As a public institution whose decisions may affect the functioning of the economy, it is imperative that we provide the reasoning behind organizational decisions. (Respondent 6)

Consistency of application of decisions or more appropriately that a consistent process is followed must be seen to be working. On a more down to earth note, applicants are sometimes woefully ill informed that they need to be told why certain decisions have been made. (Respondent 11)

Because we need to be held accountable for our actions, and have to ensure that we meet client/funder expectations. We also have to ensure that we do not lose sight of our organizational mission in the hurly-burly of daily activity. (Respondent 18)

Decisions should be transparent. If no reasons were given, clients, superiors or staff would suspect that the decision was arbitrary. Also in order to maintain client satisfaction, reasons should be given. (Respondent 14)

It is important to communicate the rationale for setting strategic direction. This ensures that decisions are better understood and accepted by stakeholders. Justification establishes a logical and rational need for the decision made. (Respondent 13)

GFSII -Q3

The relevance of Orlikowski's (1992) structural model of technology is demonstrated in the following two excerpts:

Due to the situation that IT department is ultimately and fully responsible for total IT

(Infrastructure, projects, daily activities, provision of info etc.) in this organization. (Respondent 2).

Due to technical nature of IT, it is necessary to justify decisions in terms that are understandable. IT interfaces with most functions, e.g. finance, administration, human resources, etc. (Respondent 19).

The first excerpt confirms the importance of technology as material artefacts mediating task execution in the workplace, while the second gives an example of *institutional conditions of interaction with technology* (Orlikowski, *op cit.*). For the first excerpt, decisions have to be justified because of the institutional material role that the technology plays. Both the institutional and human considerations are the reasons for decision justification in the second excerpt.

GFSIII -Q3

Turning our lens to Courtney's new decision-making paradigm for DSS, the importance of the development of multiple perspectives is evident. It is clear, however, that the O perspective dominates. This is not surprising due to the nature of the question. This means that largely, groups justify decisions because of institutional requirements and norms. There is only one very interesting P perspective, viz.:

For transparency, openness, other opinions and to cover myself. (Respondent 5)

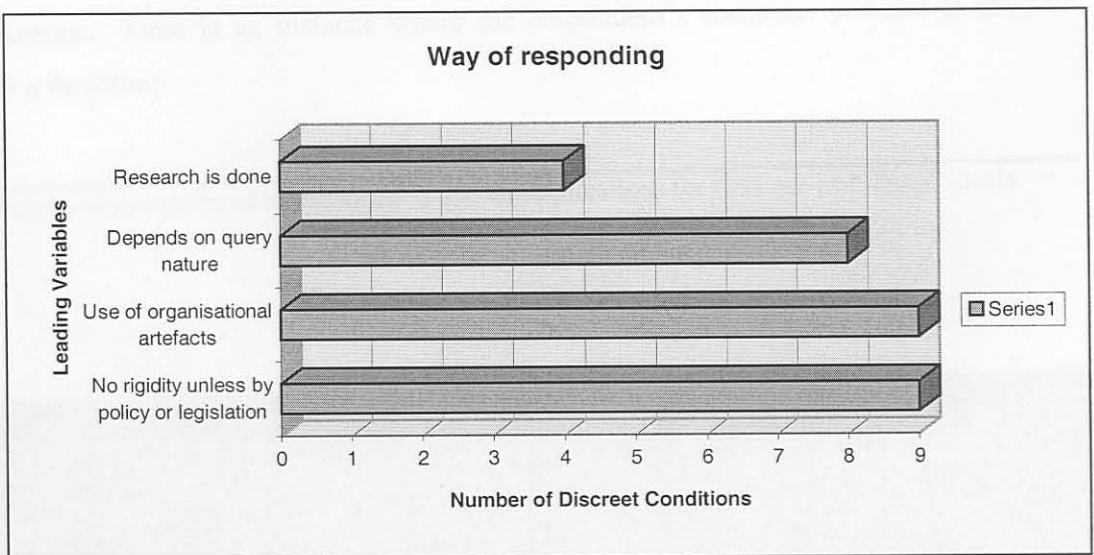
Respondents 2 and 19 as cited above (GFSII-Q3) gave some T perspectives.

Because these perspectives arise from the need for decision justification, we view them as reflecting Justification O perspectives, Justification P perspectives and Justification T perspectives.

5.16 Framework Schemes I-III applied to text from the fourth question

GFSI -Q4

The aim of question 4 was to find out how the respondent’s organization normally goes about in responding to a need for decision justification when it arises. There are four leading variables as shown on Graph 4, viz., *No rigidity unless by policy or legislation*, *Use of organizational artefacts*, *depends on query nature* and *Research is done*. From the variety of discreet conditions described by the respondents, it is clear that most groups do not have response formats or frameworks that could assist them in the decision justification process. This is problematic, for how does the group know that it has sufficiently addressed a particular need for decision justification? It is for this reason that a justification framework, such as the Toulmin *et al.*’s schema of reasoning is advocated in this study. When justifications of decisions are called for, groups must do more than calling meetings, issuing press releases and sending e-mails. All other channels of communication are obviously important, but they can only be assessed within a prescribed justification framework.



Graph 4: Morphological graph for question 4

Other than the fact that groups draw on institutional rules and resources during the decision justification process, Giddens's (1984) structuration theory in its original form is not very helpful here. However, the value of Poole *et al.*'s group decision-making as a structural process is evident. For instance the following can be regarded as *strategic tactics* group members employ to win assent for their proposals:

We call the relevant stakeholders to a meeting and give purpose and reasons why certain decisions were taken. We also use the bargaining fora to disseminate information; print and electronic media are also used. (Respondent 3)

We have broad planning frameworks, project justification tools, and budgeting templates to help us make decisions. Meetings are a critical way of responding. (Respondent 18)

When a proposal is received, acknowledgement is done telephonically, then a formal letter is sent to explain the decision. (Respondent 1)

Visual presentations, workshops, group meetings, one-to-one meetings. (Respondent 13)

To a great extent it depends on the nature of the query. There is no prototype rigid way in which we justify decisions we have taken unless so stated by a policy or legislation. When we are in a situation like this, what I normally do is to assemble the relevant officials to formulate a report. Once all inputs have been made, the response is then forwarded to the people or institutions that have asked for it. If there is need for a meeting, we convene it and discuss issues openly. (Respondent 26)

GFSII -Q4

Orlikowski's (1992) lens on the duality of technology enable us to see a classic example of how the technology is perceived as assuming the structural property of the organization. Here is an instance where the respondent's computer printout is used to justify a decision:

Every case is treated on merit. Most often it can be justified by computer information.

(Respondent 23)

The respondent clearly sees the technology as reified and institutionalised. It may well be that such a printout contain figures, which very often, are said to speak for themselves. Our view is that when decisions have to be justified, one may have to go beyond the figures themselves, to reveal a process, which produced those figures in the first place.

GFSIII -Q4

All the responses to this question could be classified as falling under perspective synthesis in Courtney's new decision-making paradigm for DSS. However, within a decision justification context, the text from the respondents seems to support the ideas expressed by us in Figure 4.12. When decision justification is called for, actions on the synthesised perspectives need to be reflected upon, leading to reflection on how the perspectives themselves were developed and thus the need to revisit the original problem. The results from actions on the synthesised perspectives do not necessarily lead to the recognition of a new problem, but the same problem from a new perspective. The following excerpts demonstrate this need for reflection:

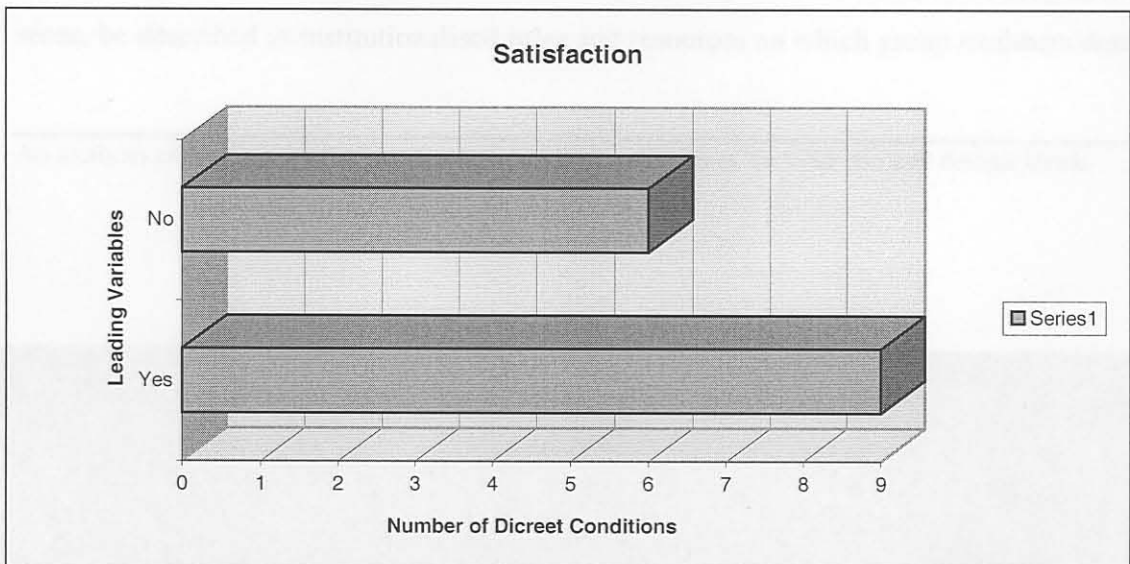
Sufficient data are gathered and reports are made in accordance with it. This usually forms as the basis of the decision. So when justifications must be made, a data-look-back will usually provide the answer. (Respondent 29)

Both the process and the rules for making decisions are clearly defined, so that when a decision must be justified, it can be done relatively swiftly and with limited problems. Again, on a more down to earth note, all requests are made in writing, as all are responses. Most decisions are accompanied by a reason (justification?) why. (Respondent 11)

5.17 Framework Schemes I-III applied to text from the fifth question

Question 5 is essentially an extension of question 4 in that it asks whether or not the respondents were satisfied with their way of responding as described in the previous question. The *Yes* (expression of satisfaction) leading variable has nine discreet conditions while the *No* (expression of dissatisfaction) has six discreet conditions. Notable discreet conditions for the *Yes* variable are that more consultation could be helpful, rules and processes can always be amplified to obviate future justification, that there is sometimes less time for making decisions and that there is always room for improvement. Discreet conditions of note for the *No* variable are that the process could be done speedier, bureaucratic processes could be reduced; that accuracy and completeness of data is needed, that the process be based on proper information and facts and that proper co-ordination in choosing respondents is needed.

The discreet conditions are qualifiers on the extent of satisfaction or the lack thereof in the responses given in question 4. As a result, the grids of interpretations for question 4 are sufficient for question 5 as well.



Graph 5: Morphological graph for question 5

Perhaps a particularly important observation based on the following excerpt can be made:

I am fairly satisfied with the way we respond in my department, however the same cannot be said about all the departments in the province. What I would like to see happening is for all the departments to have a crack team of officials whose job would be to act as Rapid Response Unit. The team must consist of diverse skills. It is in a multi-disciplinary team that a department will be able to co-ordinate inputs for a report that justifies their decisions. Be that as it may I think communicating with stakeholders right from the planning level could save a lot of time. That way your decision becomes their decision and you will be able to minimise queries significantly. Justification of decisions taken is to me a stopgap measure, which reflects that before the decision was taken there was not consensus building with stakeholders. It is therefore vital that participation be stepped up running to a decision. (Respondent 26)

The observation made here is that although the respondent is satisfied at his departmental level, he is not at a systemic level (provincial level). The respondent is proposing a decision justification process, which, in our view, could be regarded as a decision justification social practice, which we suggest in this study.

5.18 Framework Schemes I-III applied to text from the sixth question

The respondents were asked in the sixth question to list some of the tools, procedures and frameworks that they commonly used in their organizations in supporting decisions. Eight leading variables emerged: *Resources, Research, Organogram, Workshops, Meetings, Policy, Records, and Constitutional*. Graph 6 captures these leading variables and their discreet conditions in a nutshell.

GFSI-Q6

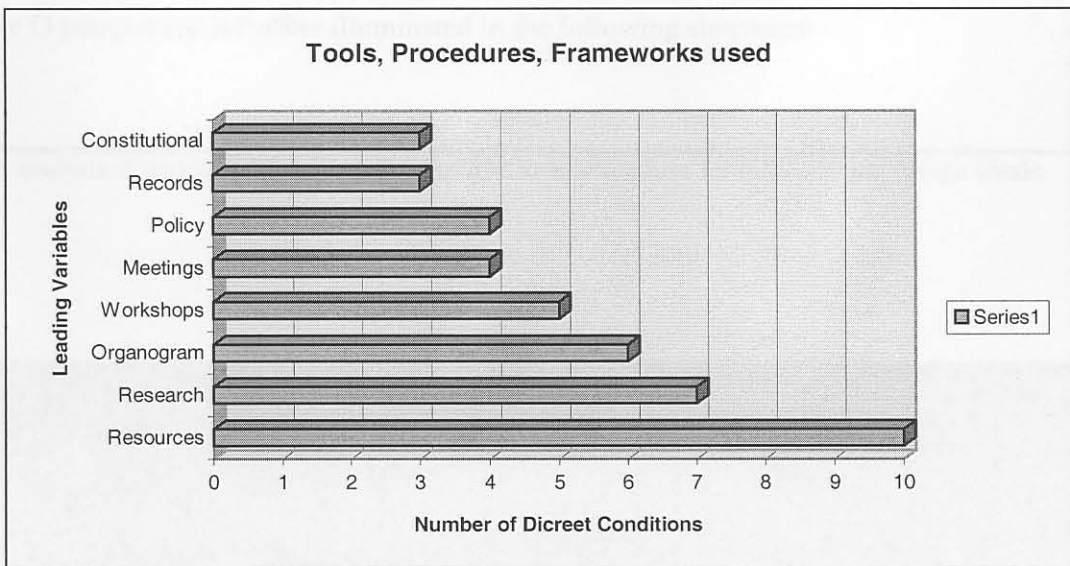
The tools, procedures and frameworks listed by the respondents could, in structural sense, be described as institutionalised rules and resources on which group members draw

on in their decision justification processes, thereby comprising part of their organization’s structures of signification, domination and legitimation. The knowledge and application of the procedures and frameworks listed constitute structures of signification. The respondents use tools, procedures and frameworks to control their decision justification process, thereby constituting the structure of domination. In the same way, these tools, procedures and frameworks sanction particular ways of going about the justification process, thereby constituting the structure of legitimation.

GFSII -Q6

The tools, procedures and frameworks listed are largely of a technical nature, making Orlikowski’s structural model of technology most relevant for interpretation. The use of certain tools, procedures and frameworks legitimises the outcomes thereof as evidenced by these respondents:

“Business intelligence software, Project management procedures, Discussion at meetings, Informal discussions, Change control procedures.” (Respondent 2).



Graph 6: Morphological graph for question 6

“Thinktools for strategy, Structured problem analysis (based on theory of constraints) for action planning, Total cost of ownership for IT.” (Respondent 8).

“Press releases, websites etc., are used for communicating decisions. TTT decisions are always supported by the mandated positions of its constituencies - labour, government, community, business.” (Respondent 6).

“Central information technology committee governance process, departmental information technology committee governance process, documented IT policy and strategy, documented conceptual architecture, documented IT domain architecture, master systems plan framework.” (Respondent 13).

GFSIII -Q6

In terms of Courtney’s new decision-making paradigm for DSS, one can immediately see the dominant role played by the T perspective in terms of tools, procedures and frameworks used by groups to justify their decisions. For instance,

MIS/EIS, CBS, budget templates, project management procedures, business intelligence software, and master system plan framework, appraisal formats, mathematical models, figures, databases, documented conceptual architecture, filing systems, computer printouts.

The O perspectives are reflected in the following consolidated list given by the respondents:

Mission, PR department, central IT committee, department IT committee, context of larger organization, and objectives of organization gives framework on decision-making.

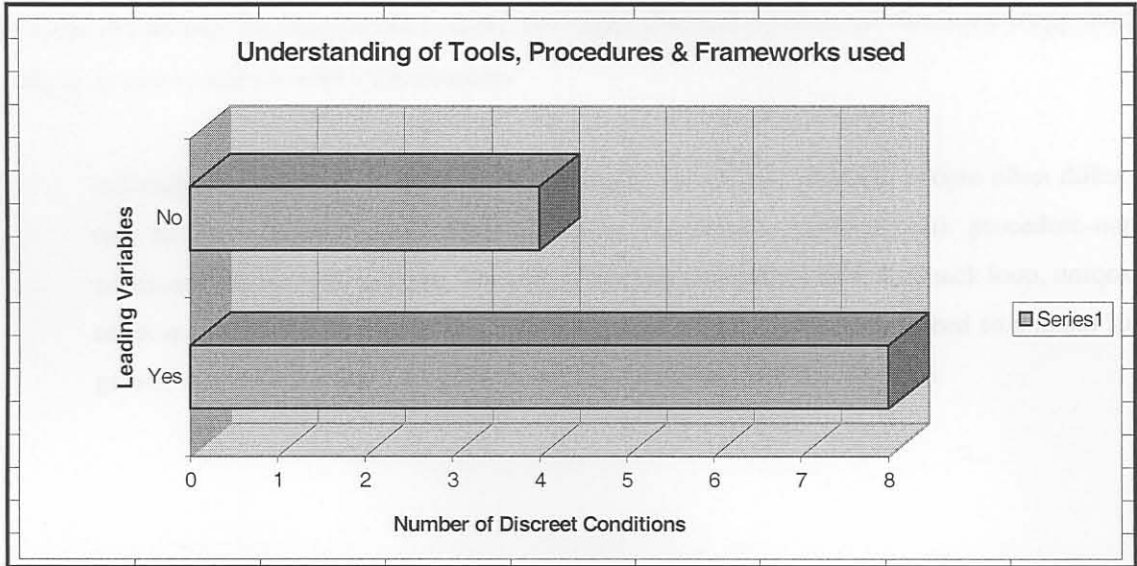
The O perspective is further illuminated in the following statement:

“Nothing can replace good research before a decision is taken. One cannot over-emphasise the importance of consulting with key stakeholders for a buy in. The tools procedures and frameworks used are chosen on the merits of the case at hand. We are no longer rule-bound organization, we are cutting down on bureaucratic tendencies, and therefore we respond according to the dictates of the request at hand.” (Respondent 26).

5.19 Framework Schemes I-III applied to text from the seventh question

Question 7 is an extension of question 6. Its aim was to check the levels of understanding of the tools, procedures and frameworks used by groups to justify decisions. The *Yes* variable has the most number of discreet conditions, demonstrating that the respondents generally think that group members from their organizations understand them. According to respondent 28, they are the mediums through which group and organizational missions are implemented. Where such an understanding is lacking, training is done and if rules are not well understood, the need for standardised procedures is proposed (respondent 14). A standardised procedure could be something like the basic patten of analysis (Toulmin *et al.*'s). Information overload as a result of the use of e-mail that enable quick exchange of documents is perceived by one respondent as a contributor to the lack of the

necessary understanding of tools, procedures and frameworks normally used to support decisions.



Graph 7: Morphological graph for question 7

The discreet conditions cited for the *No* variable points to the fact that the tools, procedures and frameworks are not necessarily understood, are not always appreciated and that there are some odd occasions of ignorance on the part of those who use them. Respondent 5 gives an example which demonstrates the lack of multiple perspectives:

“ At universities there seems to be a tendency of taking academic decisions totally separate from e.g., financial realities and market needs.”

For large organizations, it is not surprising since tools, frameworks and procedures emanates from broader organizational guidelines and policies which in most cases are always evolving. Responses for this question cannot be seen as separate from those of question 6. For this reason, it is necessary to relate the interpretation given here to that of the previous question.

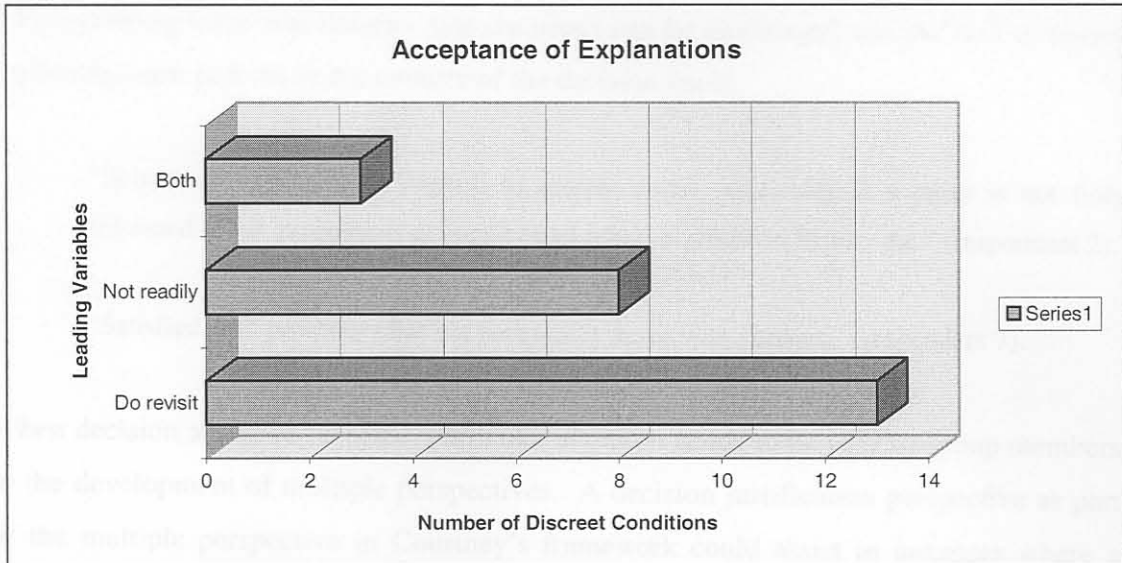
5.20 *Framework Schemes I-III applied to text from the eighth question*

Our aim in this question was to assess the relative stabilities of the procedures and frameworks used for decision justification. Relatively stable frameworks such as Toulmin *et al.*'s schema of reasoning could give long lasting benefits in different situations and contexts where decisions have to be justified. There are thirteen discreet conditions indicating that respondents revisit their frameworks:

Operating environments dynamic, sometimes compelled, procedures must always be open for changes, periodic reviews useful, resource restrictions, continually revisit frameworks in an effort to improve policy processes, if necessary, they form a useful archive, revisit through consultation, often asked to, when enough research is done, people mostly accept them, top management accept them readily.

Despite revisiting the frameworks, there are eight discreet conditions demonstrating that people do not readily accept explanations:

Individual expectations not always met, people not always satisfied, people often differ, true to life - people do contest vigorously sometimes, satisfied with procedure-not necessarily agree with content, our policy making procedures lack feedback loop, unions often question our decisions, they form a useful archive, sometimes need to explain in greater detail - especially if a party is not fully informed about procedure.



Graph 8: Morphological graph for question 8

GFSI -Q8

The variable with most discreet conditions (Do revisit) reveals the importance of changing context and the need for a total decision picture. Although groups do revisit their decision-making frameworks, those affected by group decisions may still challenge the procedures followed. The merits of a procedural schema such as Toulmin *et al.*'s schema of reasoning could be helpful to the groups in such instances. Because groups use different forms of justification frameworks about which those affected may be less informed, group decisions will be open for a challenge both procedurally and substantively. Familiarity with Toulmin *et al.*'s schema of reasoning could be helpful. They will know that if they are challenged on procedural basis, they will need technical skills to present their arguments in such a way that they can demonstrate sources of their authority. If they are challenged on substantive basis, they will need the art of recognizing what warrants are applicable and reliable.

GFSII-Q8

We are able to see through this Framework Scheme that explanation frameworks outside accepted social practices are inadequate. This is because in order to explain, people must draw on the structural properties contained in these social practices (structuration). This is well captured is respondent 32's response:

"... they are readily accepted, but the context is changing at an increasingly rapid pace and therefore people need to be constantly reminded what the bigger and total picture for decision-making in the University involves."

GFSIII-Q8

The following responses indicate that decisions can be challenged due the lack of clarity on the decision process or the content of the decision itself:

"Sometimes we need to explain in greater detail -especially if a party is not fully informed about procedures or background info.(i.e, situation history etc." (respondent 2).

"Satisfied with procedure but not necessarily agree with content." (respondent 7).

When decision are to be justified, particular attention needs to be paid by group members to the development of multiple perspectives. A decision justification perspective as part of the multiple perspective in Courtney's framework could assist in instances where a group is challenged on the basis of the procedure they have followed in arriving at a particular decision. Respondent 26 suggests a hermeneutic process:

"When enough research has been done, people accept the explanations, however if the opposite is true, we are compelled to revisit our responses until we have satisfied the people..."

Courtney's framework would still be helpful even in this case, except that in instances such as this, it may be better to introduce justification as one of the perspectives in the perspectives development stages of the framework.

5.21 Conclusion on interpreting the questionnaire text

Social structure conditions social practices by providing the contextual rules and resources that allow human actors to make sense of their own acts and those of other people.

We are able to see through this Framework Scheme that explanation frameworks outside accepted social practices are inadequate. This is because in order to explain, people must draw on the structural properties contained in these social practices (structuration).

The explanatory power of Giddens's structuration theory as discussed by Orlikowski (1991) is evident. The three structural *modalities* as explained by Giddens clearly determine how the institutional properties of social systems mediate deliberate human action and how human action constitutes social structure. Groups draw on *interpretive schemes*, which are standardized, shared stocks of knowledge used to interpret behaviour and events, hence achieving meaningful interaction. They use *resources*, which are the means through which intentions are realized, goals are accomplished, and power is exercised. They refer to *norms*, which are the rules governing sanctioned or appropriate conduct, and they define the legitimacy of interaction within a setting's moral order.

We are convinced that the *understanding* of the interaction of actors within such a social practice could be enhanced through Giddens' theory of structuration and hermeneutics, while the *substantive* and *procedural* aspects of the justification process would best be guided by Toulmin *et al.*'s schema of reasoning. However, in using Toulmin *et al.* schema as part of the analysis framework, we arrive at a conclusion that its practical

explanatory power, especially for group decision justification, could substantially be enhanced through coupling it with a hermeneutic circle.

The analysis further suggests that in decision justification environments, it may be more helpful if decision justification as a concept become one of the perspectives, in addition to the T, O, P, Ethics and Aesthetics in Courtney's new paradigm for DSS.

Poole *et al.*'s notion of *group decision-making* as the production and reproduction of *positions* regarding group actions underpinned by *members expression of preferences; argumentation and strategic tactic* members employ to win assent for their proposals is positively complementary to both Toulmin *et al.*'s schema of reasoning and Courtney's new decision-making paradigm for DSS.

Two important benefits have emerged from the analysis framework, the first is that it enabled us to make multiple interpretation of the same data sets and the second is that it enabled us to identify areas where one theory better illuminates an aspect of the data while the other does not.

We have thus, in a nutshell, accomplished the first leg of our research purpose by finding responses to two of our major research questions:

Question 1: *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?*

A short answer from the analysis to this question is that a group can be able to justify its decision when challenged by others to do so. This, however, could be a difficult undertaking as both the information processing and the social-psychological requirements by social structures and institutions may not have been explicitly and publicly stated in advance of the decision-making process. Because not all decisions have to be justified, there is a danger that even those that need to, could be subjected to dogmatic responses. A *decision justification social practice* is therefore necessary - a social practice that is

sanctioned by society and its institutions which encourages rational and cogent argumentation within well defined institutional and procedural arrangement for rational debate. Both the involved and the affected must accept and embrace the decision justification social practice. Groups functioning within such a social practice will be able to recognize occasions that may call for the justification of decisions and act accordingly. Training of group members and those affected by the decision on a pattern of the justification process is, however, necessary. Toulmin *et al.*'s schema of reasoning could be useful in directing and guiding such a process.

Question 2: *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?*

A group that succeed in justifying its decision to itself and others would have satisfied a social-psychological need that reduces the potential for conflict and the problem of post-decision anxiety. Being able to justify a decision would enforce accountability, which Bacharach *et al.* (1995) describe as a social psychological link between decision makers, on the one hand, and the social systems to which they belong, on the other. From an empirical and theoretical perspectives, the introduction of the concept of justification into the group decision-making process substantially enhanced our understanding of this complex process.

Responses to the secondary research questions could be summarized through a mapping of the process-based research framework proposed by Roode (1993) and the four essential elements of any complete theory proposed by Whetten (1989) onto the components of Toulmin *et al.*'s (1979) schema of reasoning. The mapping is shown in Figure 5.1. The elements of any complete theory proposed by Whetten (op. cit.) are discussed in chapter 6 as part of an evaluation of this study. In order to avoid repeating what has already been discussed throughout the analysis in this chapter, we will briefly mention the research

question types (process-based research framework) and how the mapping provides the relevant answers.

What is (“What”): *What is decision justification? - Map to Grounds and Claims.*

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?

Grounds: The underlying foundation and facts (Toulmin *et al.*); a grounding that is supposed to make our everyday beliefs and practices intelligible (Descartes, in Guignon, 1979); a philosophical “construct” that has originated at a particular point in history and work as a distorting lens on our understanding of ourselves and our world (Heidegger, in Guignon, 1979). A social practice requirement (Flood and Ulrich, 1990). A structurational process (Poole *et al.*, 1985).

Claim: Group choices, persuasiveness of arguments before claim or decision (El-Shinnaway and Vinze, 1998.)

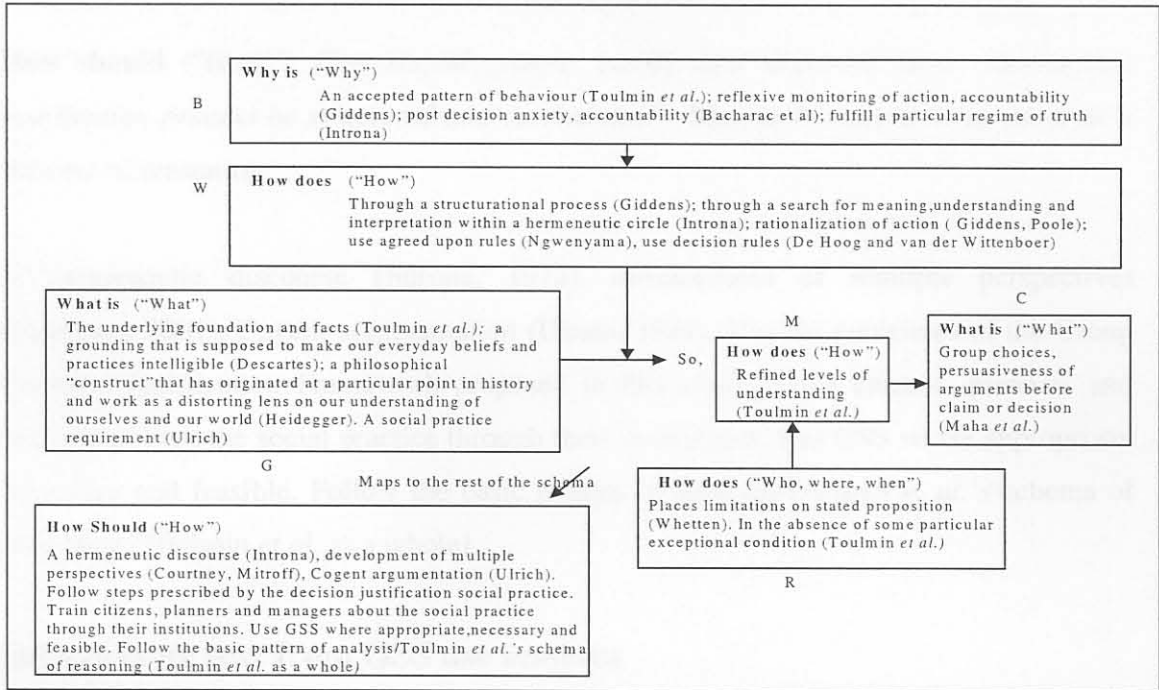


Figure 5.1: A mapping of process-based research framework (Roode, 1993), elements of any complete theory (Whetten, 1989) onto Toulmin *et al.*'s schema of reasoning-Responses to our research questions.

Why is ("Why"): *Why do groups have to justifying their decisions?* - Map to *Backing*.

Why should groups justify their decisions? To whom should their justification be directed?

An accepted pattern of behaviour (Toulmin *et al.*); reflexive monitoring of action, accountability (Giddens, 1984); reduce post decision anxiety, accountability (Bacharac *et al.*, 1995); fulfill a particular regime of truth (Introna, 2000).

How does ("How"): *How do groups compently justify their decisions?* - Map to *Warrants*.

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?

Warrants: Through a structurational process (Giddens); through a search for a meaning, understanding and interpretation within a hermeneutic circle (Introna, 2000); rationalization of action (Giddens, 1984, Poole *et al.*, 1995); use agreed upon rules (Ngwenyama), use decision rules (De Hoog and van der Wittenboer, 1995).

How does (“Who, Where and When”): *What are the limiting conditions to the justification process?*

Modality: Refined levels of understanding (Toulmin *et al.*, 1979).

Possible Rebuttal: Places limitations on stated proposition (Whetten, 1989). In the absence of some particular exceptional condition (Toulmin *et al. op. cit.*)

How should (“How”): *How should groups justify their decision? How should the justification process be structured and carried out?* - Map to the rest of Toulmin *et al.*'s Schema of reasoning.

A hermeneutic discourse (Introna, 1972), development of multiple perspectives (Courtney, 2001), Cogent argumentation (Ulrich, 1991). Use the guidelines of the Group Decision Justification Framework proposed in this study. Train citizens, planners and managers about the social practice through their institutions. Use GSS where appropriate, necessary and feasible. Follow the basic pattern of analysis/Toulmin *et al.*'s schema of reasoning (Toulmin *et al.* as a whole).

Interpreting text from GSS use sessions

While the strips as presented above would serve as organized units for analysis, we will also follow Gopal and Prasad's (2000) advice to look at the entire *project* of GSS use. In this case the project is the learning programme of the students as a result of which the data presented was produced. In line with symbolic interaction requirements, the multiple realities from each group member would be surfaced and discussed. Toulmin *et al.*'s

schema of reasoning would serve as a procedural guide and repository for the ensuing discussion. Then the alternative description of the hermeneutic circle as presented in Figure 4.1 is “swept in” and the group enters into a dialogue as described earlier. Each group member in the dialogue would inject a new perspective and place the rest of the group in a hermeneutic circle. We will call the alternative hermeneutic circle the *internal circle*, meaning the *interpretive level* where the group members are sharing their individual perspectives amongst themselves around the decision problem at hand. Because of the principle of “self” and “identity” in symbolic interaction, the alternative hermeneutic circle would work better because as Introna has indicated, the dialogue here is not the joint interpretation of a given text, but the interaction in the production of a continually changing text; where the text itself and not just the interpretation mutates. In this case the text would be the decision process. As the group members engage in their perspectives, the researcher will in turn interpret their interaction using symbolic interaction principles.

The researcher will in addition use the *external circle* (labelled project-and-understanding in Figure 4.13), which projects the interpretations from the *internal circle* to the *structuration circle*. In the structuration circle, Poole *et al.*'s (1985) notion of group decision making is used as a lens. We will focus on the three elements of group decision-making proposed by Poole *et al.* (*op cit.*) in order to track and interpret any possible convergence to a group decision. These are group members' *expression of preferences* and the negotiation of preference orders; *argumentation* as a means of advancing and modifying premises and preferred orders; and *strategic tactics* members employ to win assent for their proposals. A new understanding will then be returned, through Toulmin *et al.*'s schema of reasoning to the internal circle. The requirements of Toulmin *et al.*'s schema would assist in imposing a validity check on preferences and argumentation, which will be in the form of a series of claims, grounds, warrants, backings, modal qualifiers and possible rebuttals, which in a way would have been used by the group to reach its decision. The work of Orlikowski will also be used to illuminate the interpretation.

5.22 Framework Scheme IV & V applied to text from the first GSS use

The mechanics of the application of this Framework Scheme together with the GSS text have been presented in sections 5.6, 5.7 and 5.10 of Part II. The resulting interpretations and analysis using this Framework Scheme are shown in Tables 5.4 and 5.5, where the two tables are separated only for purposes of distinguishing the first GSS session from the second. What we wish to address in this and the next sections, is the understanding of the GSS use sessions that emerge from these analyses, taking into account both the decision-making context (context of use) as well as the decision justification context.

Table 5.4 : An extension of Table 5.2 - Grids of interpretation for GSS use session 1

	Framework Scheme IV	Framework Scheme V
GSS Session 1		
Strip 1-1	The line of argument of the participant framed within Toulmin et al's schema of reasoning is well received, except that the claim needed to be broadened to accommodate participants three's concern about previous wars. Viewing Toulmin et al's schema as a <i>script</i> within a <i>thinkLet</i> proves to be helpful. Participants engage with each other based on the pattern prescribed by the schema.	The notion of a <i>project</i> as a unit of analysis in symbolic interaction requires that all the <i>strips</i> be considered in combination as part of one project. Participant three's concern about previous wars introduces a particular contextual circumstance requiring participant one to reconsider his claim. The result was that the group started looking at ways of reformulating the claim while taking into account participant one's line of argument.
Strip 1-2	Although attracting interesting view points from other participants, the claim by participant two is not well supported. This could partly be attributed to the fact that this participant did not give a compelling argument in accordance with the schema of reasoning. Ultimately the claim by this participant was rejected by the group. Toulmin <i>et al's</i> warning that unless a claim is supported by the force of a good argument, such a claim is bound to fail, is confirmed.	The context of the claim was on the suitability of the USH in explaining the flood disaster situation in Mozambique. Again, looking at the <i>strips</i> taken together in terms of symbolic interaction, there is little evidence suggesting that this particular line of argument was of interest to any of the other participants. This may suggest that it is perhaps the lack of <i>interest</i> on the claim by other participants, rather than that it lacking the force of a good argument. This shows that a claim should not only matter, but should also be of interest to the participants.
Strip 1-3	The argument put forward by this participant led to the claim of participant one being refined to that of the group. This is evidenced by the way in which the other participants were able to follow participants three's line of argument. One can see the power of Toulmin <i>et a.'s</i> schema of reasoning depicted by the various participants as they engage participant three. The skilful way in which participant one is willing to modify his claim in order to win assent of the other	An interesting observation from this strip is that there is an intense participant interaction evoked by the line of argument presented here. The smoothness of the interaction comes out well in the strip. In symbolic interaction terms, one can see examples of multiple realities expressed here. Although each participant had his own, the flow of the argument in the strip centers around participants one and three's claims. Looking at these strips in isolation would not have been helpful. Thanks to symbolic

participants is notable. This in line with Poole *et al.*'s concepts of *strategic tactics* as well as the production and reproduction of *positions* as the group moves towards convergence.

interaction idea of a project as a unit of analysis.

Strip 1- 4

This strip is in accordance with a particular line of argument, and not in accordance with a particular participant. However, it emanates from the combination of participant one and three's claims. In arguing for the claim, the participants' arguments cannot be neatly fitted into Toulmin *et al.*'s schema of reasoning. One can see the potential for a circular argument in the absence of a guiding argument structure. It is not easy to see the basis for the various lines of arguments presented. However, almost all the structural elements proposed by Poole *et al.* can be noticed, with participants putting forward their *message aspects*.

It can be argued that the level of interaction demonstrated in this strip presented the most sense-making phase of the entire session. Strip 1-7 support this. The efficacy of symbolic interaction can be clearly seen in this strip, with participants using various symbols such as countries, helicopters, funds, infrastructure and proximity to assign multiple meanings (realities) to their arguments.

Strip 1- 5

A participant agrees more with a possible rebuttal than with a claim. A re-look at the way in which the claim was formulated suggests that the participant agreeing with the rebuttal but not with the claim may be having a good point, for if the resources were available and the intentions were good, delays due to bad communication should not have arisen. Once more, Toulmin *et al.*'s schema of reasoning provide a validity check on the arguments presented.

There are a variety of meanings assigned by the participants with regard to the speed with which assistance was forthcoming to Mozambique. Some of the meanings tend to be contradictory. These contradictions are however not out of step with the goals of symbolic interaction, allowing one to still make sense of the participants' lines of argument. The meanings that the participants attach to the delay in assistance are clearly emergent. For example the question "are you saying that the US /EU wanted people to die?" is unexpected, yet could be said to follow from the preceding line of argument.

Strip 1-6

This strip shows the convergence of various lines of arguments in accordance with Toulmin *et al.*'s schema of reasoning. A consensus claim has been reached and the group

Although still looking for better ways of packaging their final line of argument as a group, one can say that at this stage, the multiple realities of the individual participants were being

is seeking for grounds, warrants, backing, modal qualifications and possible rebuttals to support their claim. A good understanding of the requirements of the elements of the schema is demonstrated by the group.

modified to that of shared meaning by the group. The multiple realities are recognized in the form of the elements of Toulmin *et al.*'s schema of reasoning. For each element of the schema except the claim, there is more than one reality advocated.

Strip 1-7

A consensus through verbal interaction consolidating strip 1-6 is achieved. The strip is neatly scripted following Toulmin *et al.*'s schema of reasoning. The structure provided by the schema could be regarded as a decision justification meta-thinkLet, with numerous other thinkLets embedded in it. It could also be regarded as a structural process that depicts the group choice as an outcome.

Much symbolic interaction among the participants took place in arriving at the consensus presented. One can ask as to how much of the interaction could have been captured without Toulmin *et al.*'s schema and the technology support? The verbal interaction resulted in a well worded recollection of ideas generated and argued using the technology.

Making sense of the analysis

Table 5.4 shows the results of the analysis of the GSS session in accordance with Framework Schemes IV and V. The reader is reminded that at a higher level, these Framework Schemes are bound together by the hermeneutic circle. In particular, the *external circle* must be used to read the researcher's account of the text across each *strip*. The alternative hermeneutic circle (internal circle) was used by the group itself as they engaged in the dialogue, guided by Toulmin *et al.* schema of reasoning. The content of the dialogue can be found in the original unedited GSS use transcript presented earlier.

Summary of the analysis of the GSS use

From this analysis, the following can now be said:

1. Using a structure such as Toulmin *et al.* schema of reasoning to guide a group during a GSS use session is helpful, but not sufficient. It appears that what could be most helpful would be to incorporate *scripts* within each stage of the schema. Such scripts could take the form of leading questions whose responses characterise the various stages of the schema. This will help the group to know what is expected at each stage of the schema in order for them to assess the strength of their own arguments.
2. The use of Toulmin *et al.* schema of reasoning to guide the group decision justification process seems unparalleled. It would seem, however, that within a GSS use and design context, the entire schema could best be considered as a *Group Decision Justification thinkLet*. *The tools, scripts and configurations* of such a thinkLet could then be designed, developed and tested under different decision justification contexts.
3. Most, if not all the interactions amongst the group members can be explained in terms of symbolic interaction and structuration theory. Within the internal circle, symbolic interaction concepts are very helpful since the focus at this level is on multiple, rather than shared interpretations of the task to be completed and the GSS itself.

4. Because it was the goal of the GSS session that the group reaches consensus, efforts aimed at obtaining shared meanings by the group should not be interpreted as contradictions to the requirements of symbolic interaction.
5. The goal of the GSS session was achieved - the group went through a justification process to support their claim using a GSS tool.

Strip 1-5 shows a good example of how rebuttals become more significant in management decisions. As Toulmin *et al.* (1979) put it, management decisions function in social situations that almost always demand their acceptance by a number of different individuals or groups, and these social interactions are relied on to generate rebuttals from those holding different points of view. Questions will thus be put by critics to those who advance any claim, in the form of possible rebuttals, and counterclaims must be advanced to meet these rejections. As an outcome of this interaction, the final decision is expected to take all relevant rebuttals or objections into account (Toulmin *et al.*, p. 305). Thus by focusing on possible rebuttals during the dialogue, one could ensure that the multiple perspectives are accommodated in the final decision. This may suggest that GSS designed following the Hegelian approach as discussed by Courtney (2001) and Briggs *et al.* (2001) [for example the point-counterpoint thinkLet] could be more helpful in decision justification environments. Churchman (1971) would support this suggestion as it agrees with his conclusion on the guarantor problem (p.199).

Group assessment of first GSS use

On the GSS use session (use)

In keeping with what most GSS researchers normally do, at the end of the session, we asked each participant to comment about their experiences of using the GSS tool. Each was asked to give only one written comment. We could not trace the written comment from one of the five participants. The self-explanatory comments from four of the participants are presented below without further elaboration:

“ This may be useful in certain situations, especially if you have inexperienced management that cannot control or facilitate.”

“ Very interesting. A very different way of approaching the lecturing experience. This should be done much more to supply some type of practical experience in the new concepts learned in the class.”

“ Very enjoyable; novel. We actually agreed and reached consensus!”

“ Really enjoyed it. Something new. Something which I hope to take back and use within my own work environment. I think that the group was a good size. Less would not have yielded good results. More would have been too complicated. Appreciate the opportunity to experience it.”

Despite the intense levels of debate that took place during the GSS use session as evidently reflected in the GSS transcripts, the participants seem to be generally satisfied.

On the learning programme as a whole (context of use)

One of the main reasons for assessing the learning programme as a whole was to see whether Toulmin *et al.* schema of reasoning (Toulmin *et al.* (1979)) used in combination with systems thinking concepts could serve as a good organising framework to prepare groups for a decision justification process which could suitably be supported by any GSS software. The emphasis emerging from the comments is on the levels of thinking and learning that the programme provided:

“ We learnt to think, think hard, think in a new way with systems and Toulmin’s schema in mind. It was lateral thinking with some guidelines - but not too rigid. We learnt to work hard at the assignments and meet the deadlines because of the inspiration of the lecturer. Interesting and novel and original presentation. It does take some time getting used to this way but in the long run it was a challenge we wanted to overcome. I can think of no better way, keep it this way in future.” General comment: “ Hard work for

students and for the lecturer. Giving a straight lecture is much easier. Very enjoyable in spite of the hard work for us.”

“ I have learnt/gained fairly in-depth knowledge about a number of aspects around systems thinking. The module was taught in a satisfactory way. I liked the combination of lecturing and group participation. It encouraged participation and questioning. An educational experience - I learnt a lot. I would have liked a general, superficial introduction to systems thinking, covering all aspects of systems such as TSI as well, and more about decision-making!”

“ Yes, I liked the generic overview. If one needs to know more one can always go and study specifics, e.g. SSM, SODA, etc. Critical systems thinking poses valuable. If video exist for specific techniques it may be used. The class presentations by the students were excellent. We started with less confidence, but it grew over the period. I would keep the course as part of the MCom Informatics. Soft techniques (SSM, SODA etc.) could be presented in more detail at honors level.”

“ Learnt to expand thinking. Realized that a small change can have big impact. Really enjoyed class participation. Module presentation was good. Feel that students should each prepare a small portion at the next lecture topic and present it to the next class. Too short. Not enough time for all concepts. Could be divided up into separate courses. Really enjoyed the last session.”

“ Yes, the new concept of critical systems thinking where boundaries can be adjusted to include different systems. The schema of reasoning was also new. The way the class is presented relies a lot on what the class has to say. This helps with the integration of ideas and the understanding of new concepts. This is a very good approach. The CSIR group discussion makes it something different than a normal class environment. Maybe examples can be included to better understand some of the concepts. Very good course, with some good new concepts on systems... and the way we look at it. The group discussion at the CSIR was a very good idea.”

The overall assessment of both GSS use and the context of its use provided by the learning programme as a whole is largely very positive. Although other forms of support for the justification process could have been possible, we do not think that anyone of them would have provided a better support than Toulmin *et al.* schema of reasoning used within a systems thinking paradigm. The schema was also useful in organizing the *strips* in the original GSS text. We claim therefore that the Framework Schemes enabled us to make a meaningful interpretation of the data.

5.23 Framework Scheme IV & V applied to text from the second GSS use

We proceed in a manner similar to that described in the preceding section. It is thus unnecessary for us to go any further in explaining how the Framework Scheme is employed in the analysis of the GSS session as that has already been done in sections 5.8, 5.9 and 5.10 of Part II. Similarly, the results are shown in Table 5.5. We once more look at the context of use and the decision justification context. But before focusing on the results of the application of the Framework Scheme, we must point out, as a reminder to the reader, that unlike in the first GSS session, here, the lecturer made a *claim*. The participants were asked to either construct an argument in support of this claim or in support of a counterclaim in objection to it. In either case, they were required to present their arguments following Toulmin *et al.* schema of reasoning.

Table 5.5: An extension of Table 5.2 - Grids of interpretation for GSS use sessions 2

GSS Session 2	Framework Scheme IV	Framework Scheme V
Strip 2 - 1	The claim was made in advance and no counterclaim was given by the students in their first assignment. The assumption made was that they would convincingly argue in support of the claim using Toulmin <i>et al.</i> 's schema of reasoning.	Although no counterclaim was given by the students, an observation was made that their argument in support of the claim was largely considered as an academic exercise. Multiple realities about the claim and its context must have been held by the students. The students could be said to have been interacting symbolically in the true sense, for the sake of completing the task at hand.
Strip 2 - 2	This strip is about seeking for grounds on which the claim is made. This required that the participants be well acquainted with the principles of the USH and the overall basic concepts on systems together with the underlying arguments for the suitability of the NQF. Drawing distinctions between the elements of Toulmin <i>et al.</i> 's schema is problematic for the group. Perhaps a <i>script</i> to identify what counts as <i>valid grounds</i> could have been helpful to the group.	Because the grounds based on the USH and the NQF are immersed within a variety of realities in the form of concepts, recognizing these realities in the form of grounds proves to be a difficult undertaking. There is sufficient evidence from the text that eventually the group agreed on what they regarded as their valid grounds. This is despite the lack of a good understanding of what valid grounds are.
Strip 2 - 3	A clear indication that a reasonable level of understanding on what constitute a warrant existed. Perhaps a <i>script</i> to identify a warrant could have been helpful. In this particular situation, students could have picked on specific aspects of the NQF and then compared them with the principles of the USH. One participant recognized this (#88), but the other participant saw this as yet another claim. It is only in accordance with the warrant that we can move from the grounds to the claim.	An emotionally charged interaction took place on what actually constituted a valid warrant. The group continued without a clear shared sense of what constituted their warrant, although members demonstrated a fair understanding of what a valid warrant could be. So, in a sense they continued interacting symbolically in order to complete the task.
Strip 2 - 4	Identifying backing seems to be less problematic for the group. Backing provides the foundation for a warrant.	A good interaction on backing, showing good understanding of what backing entails. The multiple realities are expressed and a

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- Theoretical systems ideas behind NQF as argued by Kraak could have been used as backing. A question and answer *script* to identify a valid backing could have been helpful.
- shared perspective is arrived at.
- Strip 2 - 5** Modal qualifiers indicate the *rational strength* to be attributed to the claim on the basis of its relationship to grounds, warrants and backing. Once more, a script with leading questions could have tightened their lines of argument.
- The transcript of this strip shows that the interaction was without problems with regard to their shared understanding on what constitute the modal qualifiers
- Strip 2 - 6** Surprisingly the participants display maximum understanding of the possible rebuttal, and are able to articulate it very well. Rebuttals are the *extraordinary or exceptional circumstances* that might *undermine the force* of the supporting arguments.
- There must be some other interpretations ‘in-between’ the process which enabled the participants to assign meanings to their interaction as they proceeded. Could it be that the participants initially undermined one other’s lines of argument? Or perhaps the principle of identity in symbolic interaction was at play here - with the participants identifying themselves as ‘just students doing an assignment?’
- Strip 2-7** This strip encompasses all the elements of Toulmin *et al.* schema. It clearly shows that the group did not succeed in reaching consensus using the GSS tool. Except in statement #84, which unfortunately attempts to lump all the elements of the schema under *backing*, there were no explicit modal qualifiers and possible rebuttals. This is a surprising contradiction to strips 5 and 6, which show that the group had a good understanding of what constituted modal qualifiers and rebuttals. This demonstrates that without a proper *script*, groups can easily argue in circles, even if they have a guiding structure.
- The consensus through verbal interaction is very concise. It is mainly symbolic and far from capturing the complexity of the debate that went into it. The presence of two characters amongst the group is evident - one skeptical and the other the “devil’s advocate”. One understands why the group seemed not to appreciate anonymity. Identifying themselves could have assisted them in the interpretation of the GSS text messages based on their knowledge of each other.

Making sense of the analysis

Two pictures emerge from the analysis of the strips using the Framework Schemes. A very rich picture in terms of the possible theoretical interpretation of the GSS transcripts on the one hand, and a mixture of lean and rich picture in terms of the goal of the GSS use session and the learning programme of the group on the other. We draw on the theoretical explanations underlying the Framework Schemes to demonstrate the richness of the GSS text and on the assessment of the GSS use by the group (organised according to Toulmin *et al.*'s schema of reasoning by the author) to illustrate the mixed picture. Following the description of these two pictures, we make observations and draw some conclusions.

A theoretically rich picture

A person who makes a claim without supporting it and thereafter expect others to construct an argument in its support is similar to an artist who hangs his painting on the wall and then goes about asking others to discover his intentions through the interpretation of the painting. This is our overall interpretation of the second GSS session transcript - about which Toulmin *et al.* present an interesting explanation. Toulmin *et al.* (1979, p. 275) discuss this under the heading 'interpretive exchanges' of arguing about the arts:

“ Normally the creative artist knows perfectly well what he wants to do, and his problem will simply be how to carry that intention into effect. But the onlooker will very often have real problems in figuring out what is 'going on' in some particular work of art. So different onlookers and critics may come to exchange their views, opinions, and interpretations in the hope of seeing their way past those mysteries and difficulties. What is the prime topic of such exchanges? Some people argue that they are essentially concerned with the "intentions" of the artist himself. In this view, what can be perceived in any particular work is what the artist intends us to perceive. Others regard references to the artist's intentions as fallacious. In their view, the artwork must stand on its own feet and be subjected to critical analysis and attention directly, without regard to 'what the

artist mean.’ But this disagreement seems to rest, in part at least, on cross-purposes. Certainly the anti-intentionalists have a point: if an artist fails to bring off the effects he was aiming at, we may comment critically on his actual achievement - for good or for ill - without being distracted by his unfulfilled intentions. But the intentionalists also have a point: the difference between understanding a novel correctly and misunderstanding it certainly involves ‘what the novelist meant’ - in the sense, not *what he was attempting* but *what his message or meaning was.*” (op. cit)

Within our analysis framework, this problem of intentionalists and anti-intentionalists is resolved through the concept of a hermeneutic discourse. As previously discussed in chapter 4, unless the participants in a discourse closes themselves up from a continuous search for meaning and understanding, they cannot continuously misunderstand each other, nor can they continuously misunderstand meanings portrayed through written text or works of art. We thus arrive at a conclusion that difficulties experienced by the students in interpreting each other’s opinions, views and statements expressed through GSS use are largely attributable to *cross-purposes*, rather than to their misunderstanding of the claim made by the lecturer.

Toulmin *et al.* conclude the discussion on interpretive exchanges by indicating that in interpretive arguments, the connection between the grounds (G) and the claim (C) is far from strict, pointing out that in literature and real life alike, questions of character and motivation have to be judged with a sense of proportion and carefully chosen emphasis (p. 276). They further explain that as a result, we are rarely in a position to present arguments of ‘geometrical’ rigor. They note that however convincingly it is supported, every critical claim or judgement will be open to further comments and qualification as we approach the work concerned from fresh angles and bring novel perceptions to bear. According to these authors, we are almost never in a position to present our argument in the form “G, so *necessarily* C.” Rather, we normally have to qualify our claims and conclusions by indicating the particular standpoint or angle of view from which they are put forward:

“G, so (as a matter of psychological characterisation) C.”

“G, so (as a matter of plot construction) C.”

“G, so (as seen from America a hundred years later) C.”

Much of what is contained in the GSS transcript is illuminated by the above theoretical explanation by Toulmin *et al.* We made a claim and asked the students to construct arguments (and subsequently a consensus argument through GSS use) in its favour. From their first individual assignments, it can be said that each student was able to construct such an argument as expected. The GSS transcripts however, presents a somewhat different picture. The students struggled to put together a convincing ‘group argument’. In this regard, the following can now be said:

1. A considerable level of training on the application of Toulmin *et al.*'s schema of reasoning is required before it could be effectively used in justification arguments.
2. Like the analysis of the first GSS use session suggests, the notion of a *script* could usefully be integrated into every element of the schema in order to prescribe the activities required at each stage of the justification process. It seems that this could be a very helpful spin-off of using the idea of a thinkLet (Briggs *et al.*, 2001) together with the schema of reasoning (Toulmin *et al.*, 1979).
3. Modal qualifiers and possible rebuttals are more significant in interpretive arguments. A good understanding of the importance of modal qualifiers and possible rebuttals could assist groups in making modest and polite statements during arguments, thereby lessening possibilities of conflict.
4. The possibility exists that groups can act symbolically in sharing their perspectives regarding how the justification process unfolded. This could be problematic when

such groups are challenged to justify their claims to others outside the group. One way of avoiding this could be to clearly state the overall purpose of the justification process and to seek agreement and understanding of this purpose before the justification process commences. This purpose must be in line with an accepted decision justification social practice.

A mixed picture

Group assessment of the second GSS use

At the end of the GSS use session, the participants were asked to make claims about the session itself, the GSS tool and the process followed. Their claims were to be supported following Toulmin *et al.* schema of reasoning using the GSS tool. The author, afterwards, reorganized their assessment arguments in term of *strips* and the Toulmin *et al.* schema of reasoning in order to align them with the analysis framework. In addition, the participants were further requested to make any other comment regarding their learning programme as a whole, including the GSS session, without necessarily restricting themselves to the Toulmin *et al.* schema. Only three assessment strips (assessment strips 1, 3 and 4) were found to be complete in terms of Toulmin *et al.* schema (the strips are shown below), while strips 2 and 5 were incomplete. These incomplete strips were grouped together with the general comments under assessment strip 6. So the mixed picture could be seen as being made of two sets of assessment strips. Set one consisting of assessment strips 1, 3 and 4 and set two made of assessment strip 6 (the general comment strip which includes strips 2 and 5). The strips are presented next.

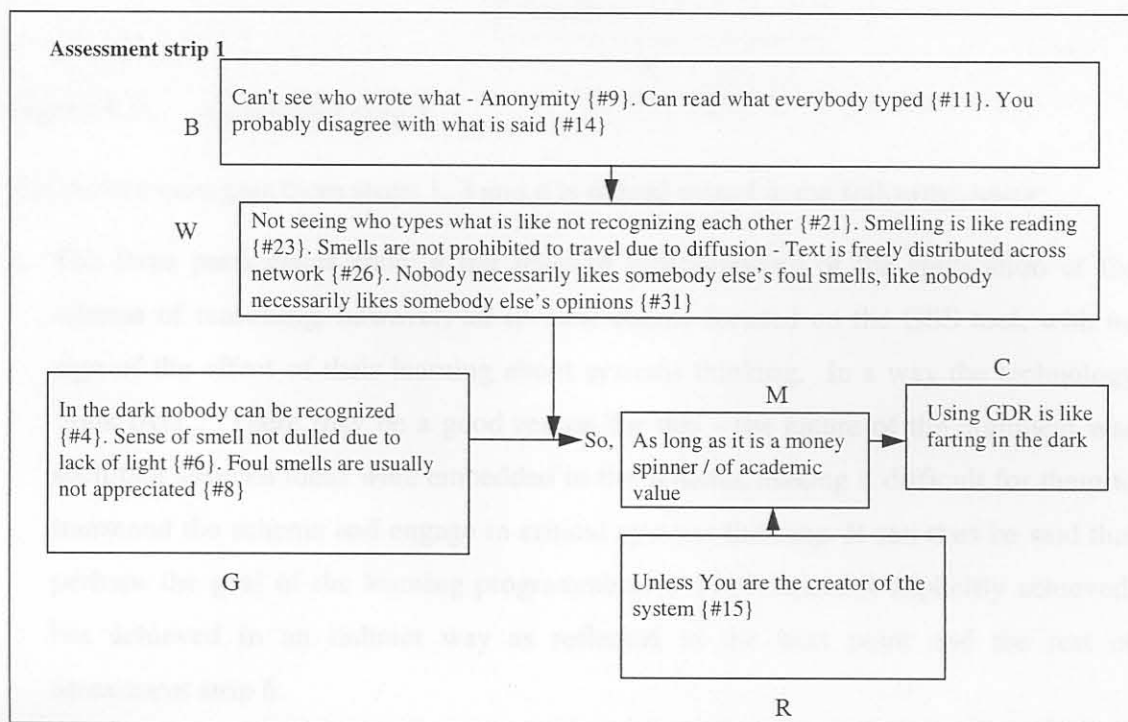


Figure 5.1: Assessment strip 1

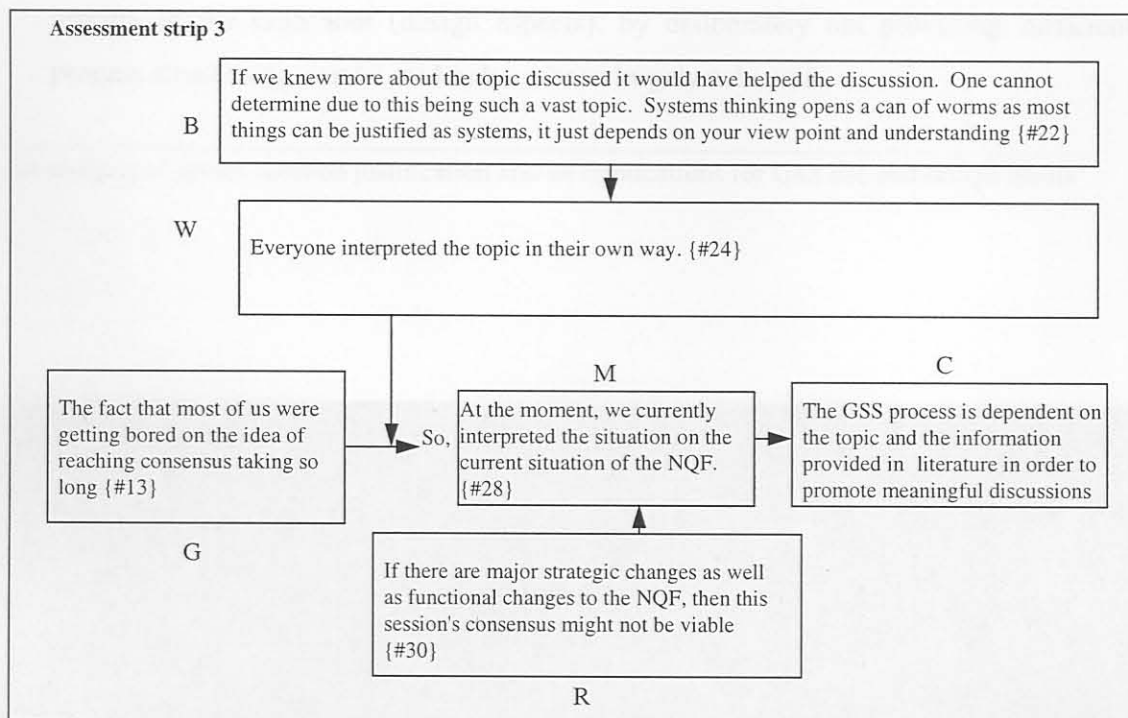


Figure 5.2: Assessment strip 3

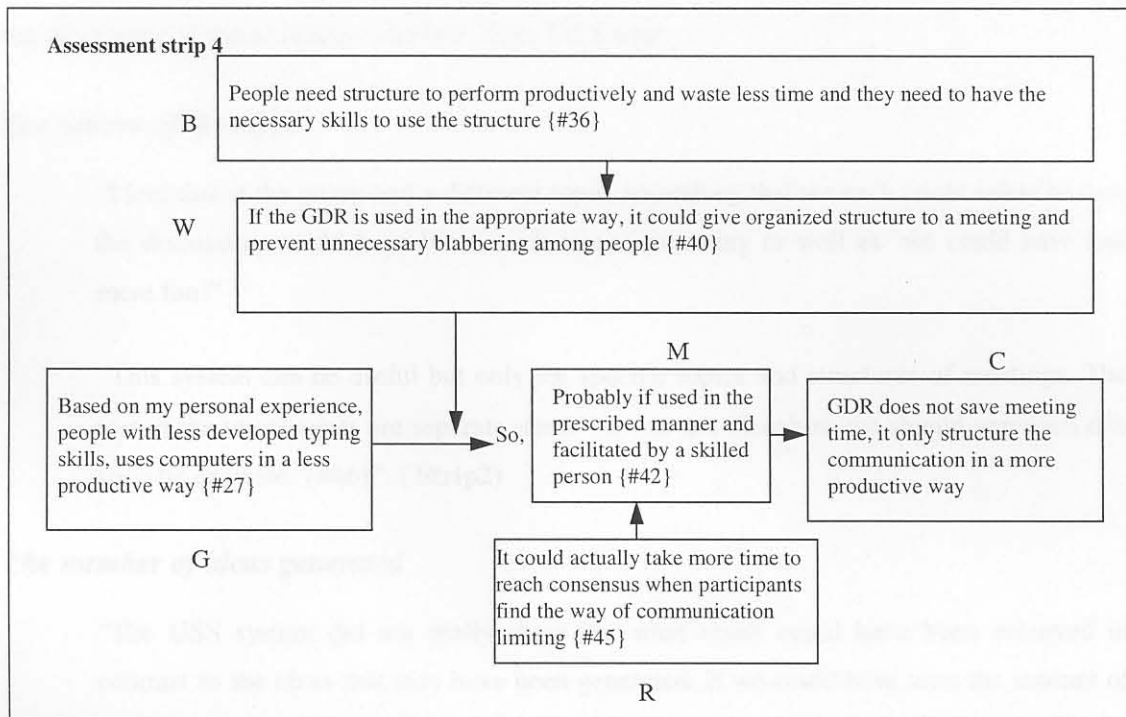


Figure 5.3: Assessment strip 4

The picture emerging from strips 1, 3 and 4 is indeed mixed in the following sense:

1. The three participants show a fair level of understanding of the application of the schema of reasoning, however, all of their claims focused on the GSS tool, with no sign of the effect of their learning about systems thinking. In a way the technology ‘took over’. There may be a good reason for this - the nature of the argument was such that systems ideas were embedded in the schema, making it difficult for them to transcend the schema and engage in critical systems thinking. It can thus be said that perhaps the goal of the learning programme as a whole was not explicitly achieved, but achieved in an indirect way as reflected in the next point and the rest of assessment strip 6.
2. The goal of enabling the group to discover some of the constraining and enabling aspects of the GSS tool (design aspects), by deliberately not providing sufficient process structuring, can be said to have been largely achieved.

3. Two of the three assessment strips highlight a particular aspect related to a design assumption of the GSS tool. Strip 1 questions the value of the anonymity feature while strip three challenges the notion that GSS facilitated discussions save meeting time.

Assessment strip 6

All expressions in this assessment strip have to do with the constraining or the potential enabling aspects of the GSS tool. We have categorised them into five themes: the nature of the topic, the number of ideas generated, talking vs. typing and more knowledge about the functioning of the system, inadequacy of perceptions in assessing the GSS tool and the discovery of some design aspects of the GSS tool.

The nature of the topic

“I feel that if the group had a different topic, something that we each could relate to then the discussion would have been much more interesting as well as we could have had more fun!”

“This system can be useful but only for specific topics and structures of meetings. The rest of the topic/points are separate items - it was not clear how we should approach this specific exercise. {#46}”. (Strip2)

The number of ideas generated

“The GSS system did not really show me what result could have been achieved in contrast to the ideas that may have been generated. If we could have seen the amount of ideas generated by the system vs. the amount of ideas generated by a normal meeting we probably would have been much more at ease with the system {#39}”

Talking vs. typing and more knowledge about the functioning of the system

“Also if we were given more information or examples of how this system works, we probably would have been more able to understand the system. For me it was a bit difficult to type instead of talk because you can say what comes to mind, and it is a bit difficult to type when you actually want to say something {#43}”

Inadequacy of perceptions in assessing the GSS tool

“Ground is the foundation of the claim to be accepted - in this case the grounds are personal experience of the application. {#18}. The experiential framework and perception by people of a tool or process is critical to its effective use {#25}. Experience of one person not adequate to judge the acceptability of a solution - additional experience outcomes need to be added. {#32}. Probably this system can be easier when there is lots to discuss, but when one point is being exhausted {#44}. The comments from whole group is based on present perceptions if this is the only exposure to a GSS tool {#35}. A more appropriate structure for discussion may have created a vastly different claim {#38}”

Discovery of some design aspects of the GSS tool

“If you use the append before and after - you can insert your comment after the one you are replying to - this then provides the reason for the exclamation marks in the system - which indicates the comments that you may not have noticed. But then you need to move your cursor onto each statement that you have read so that the exclamation points only show the ones you have not actually read..... {#133}”.

“Communication and discussion is more difficult with GSS than without GSS. Warrant: Good communication requires more than just typed words. Concepts like emotion and tone of voice is missing and makes it difficult to understand the message from the other persons. It is also difficult to go into a discussion if the other party keeps on changing. What I mean is that you are busy with a discussion with one person on a certain topic and someone else makes another comment, it becomes difficult to keep to a certain way of reasoning with the same person. {#41}”. **(Strip 5)**

Although the technology seem to have ‘taken over’ in terms of the goal of GSS use and the learning programme as a whole, almost all the assessment strips point to some aspect of design of the GSS tool, indicating that we have largely achieved the goal of the second leg of our research, at least in as far as the analysis of the GSS text tells us. The students were able to discover some of GSS design ideals regarding the type of support that groups, according to the literature, typically get from such tools.

For completion, we repeat the two primary research questions for this leg of our research purpose:

- *Can the social-psychological aspect of group decision-making be modelled in a way that could inform the design 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?*

The next and the subsequent sections of this chapter explains in detail how these questions have been addressed.

5.24 About GSS design ideals: some observations from the analysis

The conclusion on interpreting the text from GSS use session could best be described and explained in terms of ideals. It is a fact that behind every GSS there is a design ideal; an ideal which encapsulates the designer’s desire to support the group in achieving their goal. Very often this is hidden from the users as to which aspects in their goal could best be supported. This does not render these ideals useless, as long as they are pursued within a framework that urge humankind on in quest of a better end state (Mitroff and Linstone, 1993, p. 154). If justification of decisions by groups is a desired better end state for humankind, then the ideal of designing GSS to assist in the pursuit of this desired end

is a worthwhile exercise. However, such design ideals must be guided by the ideal of decision justification, and should therefore not be hidden from the group. Our view is that preparing groups along the lines we have presented in this study could benefit both the designers and the groups as GSS design should always be evolutionary. The analysis has shown that prepared groups are able to pick up the hidden design principles of the designer - for instance, the principle of parallel communication in GroupSystems which is aimed at addressing the problem of “process losses” in ordinary meetings. Here are some of the key observations from the analysis of the two GSS sessions:

Observation from the first GSS use session:

Observation 1: The students were able to consciously and critically reflect on what kind of support they needed from the GSS software in assisting them to accomplish their task. Evidence to this could be found in the following statements by the participants:

“... is it not better to look at one person’s claim, deal with it and complete it before we moved to the next one ?”

“ No, I do not think that is better; you see, I think the power behind this GSS is precisely that fact ... to be able to engage in more than one issue at the same time. That way we can simultaneously be able to see everyone else’s claim...”

Observation 2 : Toulmin’s schema of reasoning enabled the group to see transparently the audit trail of their arguments as they converged towards a consensus claim. A participant remarked with great satisfaction:

“...yes, we have actually reached a consensus..., and I can see how.”

Observation 3: The knowledge of the students about systems thinking and critical systems thinking enabled them to discover some of the design considerations embedded in the GSS software as demonstrated in the following remark:

“...can I change the submission I have just made about my backing? OK, so only the facilitator can do that after everyone else has seen it. It means I have to be more careful before submitting”

Observation 4 : The students acknowledged in their written evaluation at the end of the module that the kind of thinking skills they acquired in the module enabled them to look at issues in a much broader context than usual.

Observations from the second GSS use session:

Observation 1: Although the group went through exactly the same learning programme as the first, the outcome of their GSS use reflects very little explicit impact of their learning about systems thinking. The “thinking” and the “sense-making” of the group *prior* to the use of the GSS seem to have been lost. There is little evidence of a critical reflection based on this “thinking” as they used the GSS software to support them in the justification process. This is contrary to the outcome shown in the first group.

Observation 2: Less process structuring resulting from lack of instructions (or script) by the lecturer seem to be the reason why the group focused on the technology, making it difficult for them to transcend beyond this technology to engage in a critical systems thinking mode which could have assisted them to structure their arguments in a systematic way while using the tool. This could have lessened their frustration which is prevalent in their GSS use transcripts. On average however, this group has discovered more design aspects of the GSS than the previous one, suggesting that perhaps our design of the experiment yielded the desired results in terms of the addressing the second leg of our research purpose. The discovery of more design aspects of the GSS tool by this group may be an implicit indicator of the degree of learning of the group from the learning programme as a whole.

Discussions on design ideals takes various forms in the IS literature. For instance De Vreede and De Bruin (1999) refer to them as underlying assumptions and uses an action research approach to challenge six assumptions built into GSS. The assumptions they focus on which they identify from their experience as having guided the design and application of GSS are that : (1) meeting processes should be “fair”, (2) meeting processes should be “open”, (3) meeting processes should be “rational”, (4) groups should be guided by a process facilitator, (5) groups should exchange as much information as possible and that (6) people are cooperative by nature, with respect to each other and to the meeting process. We share some experiences with most of the results reported by De Vreede and De Bruin (1999).

Ciborra (in Currie and Galliers, 1999, p1149 - 151), consider systems for which their design rationale includes a vision of decision-making as an intrinsically improvised process. His discussion is delimited according to key improvisation dimensions of *situatedness* (systems for the here and now), *resources for improvisation* (systems to access and retrieve experiences), *communication and shared context* (systems which constitute a shared context for interpretation) and *reflection and learning* (systems which can support reflection-in-action and learning for smart improvisation, keeping track of *ex post* reconstruction, by an observer or the actor, of the rationale of performed actions or any organizational move and establishing precedents endowed with interpretation). Ciborra gives examples of already existing computer-based systems to support each of these dimensions. The driving ideal behind these systems is improvisation in decision-making, just as the driving ideal in our study is justification in group decision-making.

Klein and Hirschheim (1989) take a philosophical line in discussing IS design ideals. By showing some examples of design ideals, which they see as a description of the ultimate good to be achieved through system design, and presenting the argument that information technology is not “neutral”, they presented what they call the dilemmas of choices between conflicting design ideals in information systems development. According to

Klein and Hirschheim, these dilemmas can be resolved if the doctrine of an impartial professional practice based on a *value free* scientific method is abandoned in favour of a much broader concept of science. They quote Radnitzky (1970, p. 1) as having proposed such a broader view: "We conceive of 'science' essentially as a knowledge improving enterprise." Knowledge in this sense is not limited to what can be learned from empirical data collection or mathematical deduction, but includes all human insight and wisdom that can be exposed in *moral discourse*. In moral discourse, the competing value claims are interpreted, related to each other, and justified. It was largely this philosophical line taken by Klein and Hirschheim that partly informed our initial thoughts in this study.

In an interesting and very relevant study to our topic, Turoff *et al.* (2002) provide a statement of the requirements for and some design examples of what should constitute a Social Decision Support System (SDSS). The design ideal of such a system embodies the hope that modern human networking technology can be configured and used to allow the emergence of a collective human intelligence by very large groups of individuals. After presenting a process model of a SDSS, they use an example of a typical SDSS to support explorations of the use of EZ Pass technology to detect speeding, and demonstrate that elements of Hegelian, Kantian, and Singerian Inquiry Process underlie such a structure.

Collectively, the design ideals together with the already available technology discussed above point to the fact that the design and development of Group Decision Justification Support System (GDJUSS) guided by a decision justification social practice is both feasible and attainable. We will however not go so far in this study. We would rather leave that out as an area for further research designed along the lines we are proposing.

5.25 Conclusion on interpreting text from GSS use sessions

We described two interpretive GSS experiments conducted as part of a larger learning programme of masters students in informatics (Information Systems). These interpretive

laboratory experiments provide the basis for further field experiments in which a number of issues with implications for GSS use and design ideals could be investigated:

- Exposing groups to critical systems thinking and Toulmin *et al.* schema of reasoning seems to provide groups with a suitable and flexible framework which could be used in conjunction with any GSS, and which could be useful in the process of justification of group decisions.
- Groups using GSS are not just consumers of the products. Properly exposed to and trained in critical systems thinking and Toulmin *et al.* schema of reasoning, they could be able to add more value during the evolutionary design process of GSS development. There is therefore a need for a move towards “*thinking support systems*” as a “*training intermediary*” prior to the use of any GSS software. It seems to us that research on thinkLets (Briggs *et al.*, 2001) could substantially contribute towards this goal.

Associated with the above issues which have implications for GSS use and design ideals are two additional points: The first is that each individual coming to a GSS software facilitated session comes with an agenda, expecting the other people to listen to him/her, and if possible to accept his/her viewpoints. For this to happen he or she must present a good argument which is compelling and make sense to the rest of the group. This sense-making and shared understanding has to happen *before* the use of GSS technology. This is where prior knowledge of soft and critical systems thinking by all group members could be helpful. Once this has happened, the issue under consideration becomes “harder” and the use of technology is likely to deliver benefits. Training of group members in systems thinking before the use of GSS software could thus be expected to be beneficial. The second point is that GSS researchers repeatedly point to the need of an appropriate framework, structure or protocol to be used in conjunction with GSS. They are, however, cautious to indicate which one is likely to be useful for all group situations (see DeSanctis and Gallupe, 1987), although they accept that in general, adding structure to the decision process positively impacts decision outcomes. We conclude here that in

instances where justification of decisions are called for, Toulmin *et al.* schema of reasoning is a very suitable and flexible structure which could successfully be used with any GSS software. Training groups on how the schema could be used in different contexts of an argument could better prepare the group to use any GSS not just to complete their decision-making task, but also to provide a very clear audit trail of the process they have followed to reach their goal.

5.26 Chapter conclusion

In concluding this chapter, we must emphasise the explanatory power of structuration theory (Giddens, 1984) at various levels of our analysis framework. As Orlikowski and Robey (1991) pointed out, structuration theory allows elimination of the artificial partitioning of research attention between macro and micro levels of analysis. This is because the process of structuration operates at multiple levels of analysis: individual, group, and social system (organization and society). Rather than requiring analysis at either the individual or organizational level, structuration provides concepts for effectively bridging levels of analysis which we found very helpful throughout the application of our Framework Schemes. Orlikowski and Robey (*op.cit.*) indicate further that typically, the role of structural properties in shaping human action and interaction is transparent to human actors. Actors often believe they act freely within organizations, and hence structural properties remain unacknowledged as the conditions of their action. Whether individuals are conscious of the influence of these properties or not, their action is not possible without the interpretive schemes, resources, and norms they use to realise.

Seen within this structurational context and critical systems thinking as proposed by Ulrich (1991), societies that value democratic ideals, could through their institutions, embrace a *decision justification social practice* which would require that:

- When making a conscious and well intended decision that has a likelihood to negatively affect others;
- Follow rules of rational and cogent argumentation guided by the principle of multiple perspectives and Toulmin *et al.* schema of reasoning;
- Set boundary judgements and demonstrate that these cannot be justified rationally.

The acceptance of such a decision justification social practice would, within such societies, determine decision justification practices by various individuals and decision-making groups. Different justification schemas could then be developed in order to inform and direct the implementation of the social practice. In this thesis, we argue that Toulmin *et al.*'s schema of reasoning embedded within a hermeneutic circle should be central to such justification schemas. We thus arrive at Figure 5.1, the Group Decision Justification Framework. We leave the discussion of its finer operational descriptions to the last chapter.

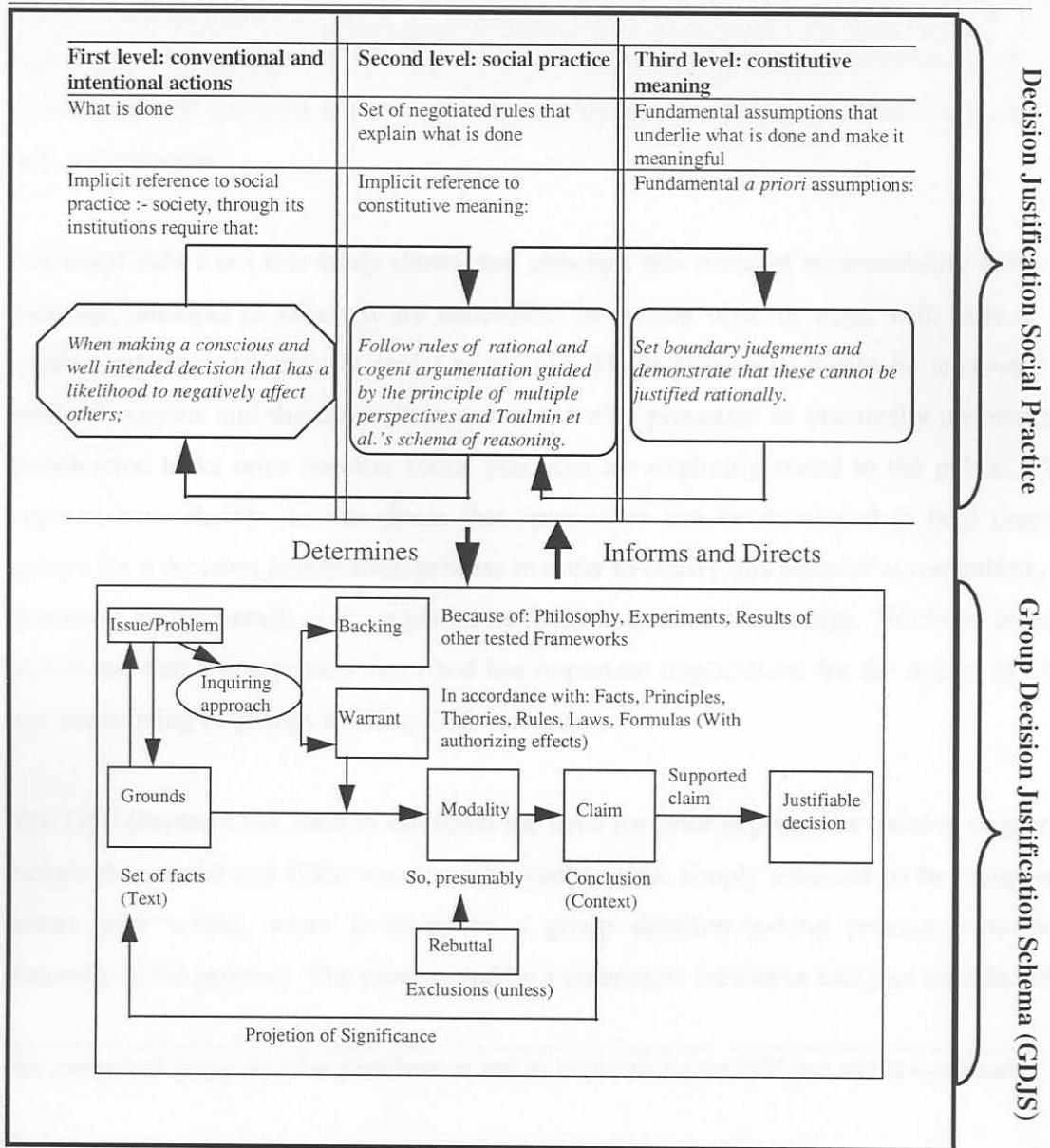


Figure 5.1: Group Decision Justification Framework

It is perhaps appropriate at this stage to re-look at what Bacharach *et al* (1995) had to say. They noted that decades of social psychological research suggest that one of the primary factors shaping human decision-making is the anticipation of post-decision anxiety and the decision maker's consequent need to reduce it - indicating that in organizations, a primary source of this anticipatory anxiety is *accountability*. Underlying every

managerial hierarchy in complex organizations is some norm of accountability. Quoting Tetlock (1985, p.307), they went on to say:

‘Accountability is a critical rule and norm enforcement mechanism; the social psychological link between individual decision makers, on the one hand, and the social systems to which they belong, on the other. The fact that people are accountable for their decisions is an implicit or explicit constraint upon all consequential acts they undertake (if I do this, how will others react?).’

According to this norm of accountability, in order to reduce post-decision anxiety, decision makers must be able to explain their decisions as justified and therefore legitimate. According to Bacharach *et al.* (1995), decisions must be justified not only to those whom the decision maker is directly accountable to, but also to others (e.g., peers, self, subordinates).

Empirical data from this study shows that although this norm of accountability exists in societies, attempts to satisfy it are undertaken in various obscure ways, with little or no explicit reference to specific social practices. These obscurities could be attributed to political reasons and the difficulties associated with processes of practically undertaking justification tasks once specific social practices are explicitly stated to the public. We hope to have shown in this thesis that approaches can be developed to help prepare groups for a decision justification process in order to satisfy this norm of accountability as described by Bacharach *et al.* or just to be ready in case of a challenge. We hope to have shown too that the approach described has important implications for the design of GSS and the training of groups in using GSS software.

The GSS literature has little to say about the need for prior exposure or training of groups before they could use GSS: users are, it would seem, simply assumed to be competent actors who would, when involved in a group decision-making process, contribute naturally to the process. The process, led by a competent facilitator using an established

GSS, steers the group towards a group decision with ease, achieving much in terms of process gains, as pointed out by GSS researchers. What is unfortunately forgotten, however, is that the members of the group have in the process lost any form of rational reasoning which might in decision justification social practice environments as described above, afterwards be required to justify its decisions. The group has, in effect, just become a synergistic whole creating lists of ideas which are prioritised and fleshed out with action items. We would not argue that this does not have its place in the broad spectrum of group decision-making activities. We do believe, however, that when justification of group decisions are called for, one has to do better than providing stimuli for the mental activities of a group of people and structuring the resultant cognitive results. We submit that the results of the analysis and the group decision justification framework we have developed would make a substantial contribution in helping to enhance an understanding of the group decision-making process and how this process could best be supported through the design and use of GSS technology.

The next chapter discusses the overall conclusion of the study.

Chapter 6

Conclusion

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Chapter 6

Ultimately, it may only be through the use of multiple lenses that we can develop a useful body of knowledge about GDSS and its use.

Abhijit Gopal and Pushkala Prasad

The only justification for our concepts is that they serve to represent the complex of our experiences; beyond this, they have no legitimacy

Albert Einstein

Conclusion

6.0 Introduction

This research was undertaken within the confines of an *interpretive* philosophy, with *hermeneutics* employed both at the philosophical level and as a specific mode of analysis. The quality of the interpretive analysis presented can thus be evaluated in accordance with Klein and Myers' (1999) set of principles as briefly outlined in chapter 4. Before discussing the evaluation and the assessment of the contribution made by the study, we first present the conclusions drawn from it. The conclusions are organised as follows:

Drawing on the literature and the analysis presented thus far, we present in Part IV what we consider to be the prerequisites for decision justification. Part V discusses the enhanced understanding of group decision-making when group decisions have to be justified. This is accomplished by revisiting the theoretical lenses that constituted the analysis framework used in the study. Based on the empirical evidence presented in chapter 5, suggestions are made as to how these lenses could usefully be adapted for decision justification environments. Part VI discusses the implications for GSS use and design ideals informed by Toulmin *et al.*'s schema of reasoning, symbolic interaction and thinkLets. Finally and in conclusion, we discuss some critical reflections and evaluation of the study in terms of its quality and the contribution it makes to information systems research.

Part IV: Prerequisites for decision justification

6.1 *Situating the idea of decision justification as a social practice*

Using Werner Ulrich's (1991) description, the problem addressed in this study could be described as the *problem of practical reason*. It is the problem of how rational discourse can redeem the validity claims of practical propositions – their claim to secure improvement and to be rationally justifiable (Ulrich, 1991, p.104). Although our problem is a very special case in that the validity claims are group decisions, the problem essentially belongs to practical philosophy as described by Ulrich. Ulrich points out that although contemporary practical philosophers such as Lorenzen, Lorenzen and Schwemmer, and Jürgen Habermas have developed “ideal” models of practical discourse which give us essential insights into the conditions that would allow us to justify disputed validity claims, these models, because they are ideal, are impractical (not realisable). Ulrich dealt with this problem in two ways:- firstly, he developed a new approach called Critical Heuristics of Social Systems Design. Central to Critical Heuristics is the *setting* (own emphasis) of *boundary judgments* by those involved and those affected, the *demonstration* that such boundary judgments cannot be justified rationally and the *translation* of their own subjective ways of being affected by the boundary judgments in question into rational, cogent argumentation. Secondly, he proposed a program of research aimed at developing a conceptual framework, which, amongst other functions, would embed conventional “hard” and “soft” systems tools within well defined *institutional and procedural arrangements for rational debate*.

Based on Ulrich's work, we can describe *justification social practice* as the ability and willingness on the part of those involved and those affected to set boundary judgments and to translate those judgments into their own rational and cogent argumentation within a well defined institutional and procedural arrangement for rational debate.

Combining this description with the three layers of interpretive analysis of Table 4.1 (Flood and Ulrich, 1990), we can present the proposed theoretical framework of the decision justification social practice in Table 6.1.

All forms of decision-making within such a social practice would naturally take into account the need for decision justification. Based on the insights from our analysis, we can further suggest that for a decision justification social practice to be effective, the following criteria needs to be satisfied:

Table 6.1: A theoretical framework for decision justification social practice (adapted from Flood and Ulrich, 1990)

First level: conventional and intentional actions	Second level: social practice	Third level: constitutive meaning
What is done	Set of negotiated rules that explain what is done	Fundamental assumptions that underlie what is done and make it meaningful
Implicit reference to social practice :- society, through its institutions require that: <div style="text-align: center;">↓</div> <i>When making a conscious and well intended decision that has a likelihood to negatively affect others;</i>	Implicit reference to constitutive meaning: <div style="text-align: center;">↓</div> <i>Follow rules of rational and cogent argumentation guided by the principle of multiple perspectives and Toulmin et al.'s schema of reasoning.</i>	Fundamental <i>a priori</i> assumptions: <div style="text-align: center;">↓</div> <i>Set boundary judgments and demonstrate that these cannot be justified rationally.</i>

- I. Both the involved and the affected must be *familiar* with the decision domain; for otherwise the justification process would have neither the basis nor the audience.

- II. The decision made or to be made within the domain must *matter* to the involved and the affected; else why bother about the justification process.

- III The practice must be sanctioned by society through its institutions as one of its

good social practices.

- IV. The involved and the affected must accept and embrace the decision justification social practice. They must imagine that the decision made or to be made within the domain must be justified to others.

These criteria, especially that pertaining to familiarity with the decision domain together with the *substantive* and *procedural* aspects of the decision justification social practice, would require some form of *training* of ordinary citizens, planners, and decision makers in tracing its normative implications in a manner similar to that alluded to by Ulrich. This is because as Ulrich (*op.cit.*) puts it, *practical reason requires* that the standards of *value* of all the affected - be they involved or not - converge. Ulrich gives an example of such a training as that of explicating the *kinds of boundary judgements* that usually flow into the definition of a system. In this case, the training could explicate the essence of Toulmin *et al.*'s schema of reasoning together with aspects of the development of multiple perspectives in decision-making. We have, at a micro level, developed in chapter 5, a form of training that could serve as a starting point. One may criticise us and say that it is too ambitious to think of training ordinary citizens in the way that we suggest. However, Toulmin *et al.* give us a further recipe of thought about this. They point out that the study of rationality and rational criticism is like the study of *grammar*, which takes the speech we use unthinkingly in everyday life and make us more self-aware about the ways in which language is put to use and the rules that govern its use as a result. So, we can approach the training in a similar way that we approach the teaching of grammar. The various institutions in the society that sanction this practice could be used as training sites.

6.2 *The significance of the proposed social practice*

Not all decisions require to be justified. It could, however, benefit society if all decisions

with broad social implications could be subjected to a *decision justification social practice*, requiring those involved in making them to be able to justify them. The proposal we are making about the need for the social practice arises from the literature as a response to one of our research questions. This was briefly discussed in section 4.2.1 of chapter 4.

Our analysis suggests that such a social practice could be significant in several ways:

- I. It could raise awareness in decision-making groups that certain types of decisions, especially those with broad social implications needs to be rationally justified.
- II. It could enable the surfacing of fundamental assumptions that underlie such group decisions, and thus explicate how cogent arguments based on those assumptions could be presented.
- III. It could inculcate a sense of willingness on the part of those involved and those affected to recognise incompatible boundary judgments at the outset, thereby avoiding circular arguments that get nowhere.
- IV. A set of negotiated social rules embedded within a well defined institutional and procedural arrangement for rational debate, such as the Toulmin *et al.s'* schema of reasoning could be formulated and practices regularly.

The analysis presented throughout this study suggests that such a social practice is both feasible and attainable. With such a social practice in place, the only challenge would be that of accessing the *constitutive meanings* on which the decision-making group draws in their practice of decision-making. We regard the analysis framework presented in this study to be a significant attempt towards promoting mutual understanding among those involved and affected through a continuous search of what lies behind the social practice and makes the group decisions and the decision rules meaningful. We are convinced that the *understanding* of the interaction of actors within such a social practice could be

enhanced through Giddens' theory of structuration and hermeneutics, while the *substantive* and *procedural* aspects of the justification process would best be guided by Toulmin *et al.*'s schema of reasoning.

Part V: Enhanced understandings of group decision-making when group decisions have to be justified

6.3 *Insights from philosophical perspectives*

Guignon's (1979) work on *Heidegger and the Structure of Traditional Epistemological Arguments* in which the philosophical work of Descartes and Heidegger is extensively analysed and contrasted provided us with initial insights on our topic. The most important insight being the fact that Heidegger's *Being and Time* was left unfinished (arguably because his project of fundamental ontology as conceived of in the book was untenable) and that he did not object that the techniques and procedures for grounding and justifying within the regional sciences be left in order as they are. This elevated our enthusiasm in search of what those techniques and procedures could be, taking us through systems thinking, interpretivism and hermeneutics. The discovery of Toulmin *et al.*'s schema of reasoning took us to practical philosophy. Our analysis framework reflects these philosophical underpinnings.

6.4 *Through the eyes of the theories used in the framework*

6.4.1 *Toulmin et al.'s schema of reasoning*

The contribution made to our study by Toulmin *et al.*'s schema of reasoning can best be summed up in their own words when introducing reasoning and its goal in the following way:

“Rather than aiming at some unattainable ideal of mathematical perfection, we shall describe practical reasoning, as it occurs in daily use, in the hope of understanding better its actual assumptions and potentialities. Rather than abandon decision-making to whim,

power, or the effects of unreasoned persuasion, we shall describe the critical procedures through which ideas are examined in competition with each other and judged by relevant criteria so as to make it possible for us to arrive at *reasonable* choices.” (Toulmin *et al.*, 1979, p. 16)

Although used in combination with other theories rather than in isolation, the analysis framework enabled us to assess the efficacy of Toulmin *et al.*'s schema of reasoning both theoretically and empirically. In using it as part of our analysis framework, we came to the conclusion that its practical explicatory power, especially for group decision justification, could substantially be enhanced through coupling it with a hermeneutic circle as shown in Figure 6.1. We called this enhanced schema the Group Decision Justification Schema (GDJS).

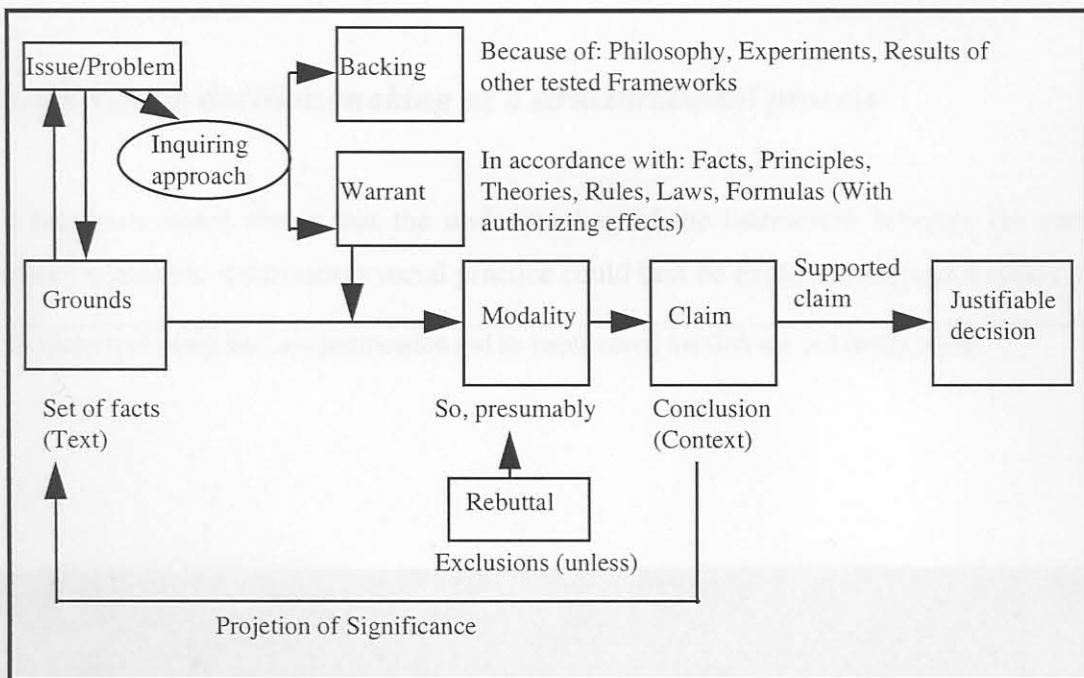


Figure 6.1: The Group Decision Justification Schema (GDJS)

The schema would function in the following way:

At the outset is an *issue or a problem* belonging to a particular social domain which meets

the prerequisites of a decision justification social practice. The surfacing of each group member's *fundamental assumptions* about the issue or the problem would be undertaken hermeneutically, with members advancing their claims and then supporting them with grounds, warrants, backing, and so on. This process would continue until the group is satisfied that a particular claim as perceived by the rest of the group is *reasonable*.

Because the group members know in advance that they will have to justify their claims to others, they would make their respective *inquiring approaches* explicit, thereby consolidating their grounds, warrants, backing, modalities and possible rebuttals into those of the group as a whole. Assuming that the group succeeds in satisfying itself to the extent that they, together, are able to say 'we claim that..., and therefore have decided...'; the justification process would be a straight forward undertaking. We are assuming here (as required by the decision justification social practice) that those to whom the decision must be justified are already familiar with the particular decision domain in question, else some form of training as alluded to earlier would be necessary.

6.4.2 Courtney's new decision-making paradigm for DSS.

The basic tenets of Courtney's new decision-making paradigm for DSS have been presented in chapter 2 and section 4.2.3 of chapter 4. They have also been used as part of our analysis framework. We have pointed out and discussed how it too could be enhanced and better adapted to the decision justification environments (section 4.2.3, page). It commences on the assumption that the decision-making group recognizes and value the *decision justification social practice*. Figure 4.12 summarized the implications.

6.4.3 Group decision-making as a structuralational process

It has been stated above that the understanding of the interaction between the various actors within the justification social practice could best be explained through Gidden's

theory of structuration and hermeneutics. However, we must point out here that with regard to *substantive* and *procedural* aspects to decision justification, our research problem is simply assumed in Giddens' structuration theory. According to him, human beings are purposive and know a great deal about why they act in the way they do. He argues that they can and do provide rationales for their actions and interactions if asked.

Taking into account the intention of the theory, and the fact that in practice people are not normally asked to explain their actions, we have no qualms with this assumed competence of actors by Giddens. However, when actors act or are perceived to act in a way that affect others, or act contrary to our normal expectations, such as making decisions which negatively impact on others, such assumed competence cannot be left unchallenged, nor can we be satisfied with the explanation that such acts are a result of unintended consequences. In such situations, more than simply assuming their competence is necessary. Even with unintended consequences, those affected must be put in a position where they can judge for themselves that it is in fact so. Other researchers have also expressed concern that this assumed competence of actors is not always sufficient. For example, according to Orlikowski (1991), Heydebrand (1986, p. 5) have pointed out that transformative social practices are not common in organisations: "The notion that social actors are - or become - knowledgeable does not completely address the fact that many actors, even though knowledgeable, fail to change the structural conditions that determine or oppress them, and as a result, simply go on to reproduce these very conditions": Merely being capable of changing structural properties does not imply that those capabilities will be exercised, and while human actors always have some capacity for independent action, there are no guarantees that such resources will be drawn on.

The explanatory power and the relevance of structuration theory to our study as presented by Poole *et al.* and Orlikowski has, however, provided us with essential concepts which substantially informed our analysis. For instance, we have adopted Poole *et al.*'s structural definition of a group together with that of group decision-making. We

have found that Poole *et al.*'s notion of *group decision-making* as the production and reproduction of *positions* regarding group actions underpinned by *members' expression of preferences; argumentation and strategic tactic* they employ to win assent for their proposals to be positively complementary to both Toulmin *et al.*'s schema of reasoning and Courtney's new decision-making paradigm for DSS. Our analysis immensely benefited from this complementarity.

6.4.4 An understanding in a nutshell through the analysis framework

We mentioned in chapter 4 that the analysis framework was our own temporal construct which, guided by the research questions, served as a lens enabling us to make sense of the data and research problem space from different theoretical perspectives all at once. The framework is therefore in keeping with the process-based research framework presented in chapter 3. By breaking it up into Framework Schemes and the corresponding Grids of Interpretation, we were able to operationalize what is essentially a theoretical construct. In addition, putting more than one theory to use within the same framework paid off in two major ways. The first was that it enabled multiple interpretation of the same data sets and the second was that it enabled us to identify areas where one theory better illuminates an aspect of the data while the other does not. As a result, it has been possible for us to suggest some enhancements to both Toulmin *et al.*'s schema of reasoning as well as Courtney's new decision-making paradigm for DSS. We can therefore reasonably claim that our understanding of group decision justification has been substantially enhanced.

Part VI: Implications for GSS use and design ideals

6.5 Understanding GSS use through thinkLets and symbolic interaction

Through the use of some form of Group Support System (GSS), we now wish to support a decision-making group within the decision justification social practice. Could consistency and repeatability of results of such form of support be our goal? It clearly should not be. Our goal should rather be to understand *how* GSS are used in those situations. Such an understanding is likely to offer us more insight on both the

technology itself and the contexts of its use, leading us to effect improvements on both the technology and the social practice. There is a very crucial aspect to be taken into account here, and that is :-

The potential support that is likely to be provided to the decision-making group through GSS use must be surfaced as part of the decision justification social practice.

In other words, if in justifying its decision, a decision-making group would use some GSS technology, then such technology must be subjected to the same level of critique as the group itself. A decision-making group cannot refer those seeking explanations to the use of a technology they do not understand. The underlying fundamental assumptions about how it would support the justification process, together with rules, facilities and other support resources embedded in it must be exposed and understood. Once again, Jones' (1994) comment that "the 'system' that supports group decision-making needs to be viewed more widely than simply the technology and should include appropriate elements of the social context" is very relevant here.

From the results of our analysis, there does not seem to be any indication that the search for consistency of GSS phenomena is a viable research undertaking. What seems to be holding some promise is a focus on understanding the interaction of group members as they use the technology. Studying patterns of thinking during group interaction as they use GSS through approaches such as thinkLets (Briggs *et al.* 2001) and symbolic interaction (Gopal and Prasad, 2000) could provide new avenues for GSS researchers.

We know from Orlikowski's structural description of technology that technology does not determine social practices, but can only condition them by enabling or constraining them - it is a medium of social practice. One form of usefully constraining these social practices could be through stimulating patterns of thinking similar to Toulmin *et al.*'s basic pattern of an argument. Patterns of thinking during GSS group interaction

could be observed, described, interpreted and in the case of thinkLets, even created

through some careful stimulus. One can then match these patterns of thinking to particular ways in which the GSS is used. Because these patterns of thinking are created through well controlled stimuli, there is hope that they may be repeatable - to the delight of positivist GSS researchers. However, repeatability of a pattern of thinking should not be confused with replicability of GSS use results. For instance a point-counterpoint thinkLet would stimulate a predictable pattern of thinking, but the results of such a pattern would differ from context to context.

We were able to make more sense of the two GSS sessions presented in this study through the use of concepts from symbolic interaction, structuration theory and thinkLets. In our view, more studies along these lines hold some promise for the future of GSS research.

6.6 *Embedding Toulmin et al.'s schema of reasoning in GSS use and design*

Interaction amongst group members as they engage in the process of group decision-making is a double-hermeneutic process. During group decision-making, group members bring to the group their own perspectives, prejudices, fore-understandings and expectations. How these interactions manifest themselves could be understood as a structuration process. Symbolic interaction and thinkLets provide *substantive categories* of interaction, which could embed Toulmin *et al.*'s schema of reasoning for *procedural* purposes when used within a decision justification social practice. Symbolic interaction would categorise the *various symbolic realities* of GSS use as perceived by the group members while thinkLets would categorise *patterns of thinking* about these realities. When used with symbolic interaction and thinkLets within a decision justification social practice, the schema of reasoning could serve as a procedural justification template.

6.7 *About supporting the group decision justification process through GSS use*

Support through use

Often, GSS use is a facilitated activity, with each individual coming to a GSS software facilitated session having an agenda, expecting the other people to listen to him/her, and if possible to accept his/her viewpoints. Assuming this takes place within a decision justification social practice, then the principles of the GDJS and the new decision-making paradigm for DSS in decision justification environments must apply. This implies that there has to be a process of sense-making and shared understanding amongst the group. This sense-making has to happen *before* the use of GSS technology, but *within the same*

contextual frame. The group must make sense of the decision-making process and the GSS technology all at the same time (regard them as parts of a single system). This can be very challenging, calling for learning on the part of the group. Training of group members in systems thinking could help the group to realise that the last “S” in GSS as well as in the new decision-making paradigm for DSS refer to a system. Training groups on how the GDJS could be used in different contexts of an argument could better prepare them to use any GSS not just to complete their decision-making task, but also to provide a very clear audit trail of the process they have followed to reach their goal, and thereby using the GSS technology as a group decision justification support system.

Supporting the design process

The GSS to support the GDJS should clearly be designed through a hermeneutic process of dialogue between the designer and the decision-making group. The designer must seek to understand what the group seeks to achieve. Like the decision-making group, the designer needs to understand the decision domain in which the group is involved, the social practice and the perspectives of the group itself. The hermeneutic circle requires that the designer continually question and make explicit his and the group’s prejudices and fore-understandings, but must also use them to facilitate understanding of the context

within which the group is operating (i.e., the broader context of the social practice). We have already pointed out that generally, GSS are designed with certain assumptions by designers. These too must be made explicit, just as group members, through the setting of boundary judgments, are expected to make their constitutive meanings explicit. The GDJS could serve as a common evolving repository as the hermeneutic process continues.

Part VII: Critical reflections and evaluation of research

6.8 Critical reflections

A multi-dimensional study such as this one cannot be smooth sailing. While it sought responses to the questions that it has raised, it has created many others which it cannot

respond to. In this section, we point out areas where such questions and challenges arose and briefly discuss our attempts at addressing them, or where other authors, whose work we have referenced have addressed them or could have done better.

The nature of the research problem:

We have addressed the problem of practical reason, which as Toulmin *et al.*(*op.cit.*) have noted, may deceptively give us the impression that we have belaboured the obvious. The idea that we should approach the study of rationality and rational criticism in a similar way as we approach the study of grammar is useful. On the other hand, the study on decision justification should as well have attracted the attention of decision theorist and practitioners over the years. In as much as we have numerous *decision support systems* and frameworks, we should be having corresponding *decision justification support systems*. The absence of thinking along these lines by decision theorists as reflected in the literature, could be attributed to the fact that decision-making is perceived as a top-down process, where decisions are made for people rather than with people. With this thinking, only certain classes of society are capable of making “good” decisions on behalf

of others while the rest must just “appreciate” them as such decisions may be too complex for them to understand. In this regard, we agree with Giddens (1984) who argue that there is no mechanism of social organisation or social reproduction identified by social analysts which lay actors cannot also get to know about and actively incorporate into what they do. So, even though our research problem has its roots in practical philosophy, it should not have escaped the imaginations of decision theorists, especially with the pursuit of democratic values which are hailed as good for the rest of the world as noted by De Hoog and Van der Wittenboer (1986) in chapter 2. They pointed out that although the obligation to justify one’s decision occurs rather often, this phenomenon has not received much attention from decision theorists. We believe that this study contributes significantly towards the achievement of this goal.

Construction of the analysis framework and its temporal nature:

We have adopted Walsham’s (1993) approach in the construction of our analysis framework in the sense that our framework is not an “out-there” theoretical frame, but rather a temporal one for analysis convenience. Our aim was not to construct a super-theory through the framework, but to use it as a construct through which to look at our problem space and the data. It is not a model, but a multi-theoretic and multi-level framework necessitated by the multi-dimensional nature of the research problem. Normally, researchers construct a theoretical model, collect data in accordance with the model and then analyse the data in order to refine the model. In this study, and contrary to the said normal approach, it is the theoretical lenses encapsulated into the framework about which refinements, only in as far as the research problem is concerned could be suggested. In other words, having accomplished its goal, the analysis framework disintegrates into its constituent theoretical components. However, other researchers following interpretive analysis of a hermeneutic nature may find a similar approach helpful.

Interpretive schemes:

One of the major inventions of this study was the creation of Framework Schemes of interpretation embedded within a hermeneutic circle. We called them Grids of Interpretation and we used them as springboards of our analysis. Using the consolidated morphological field graphs which were also our unique invention, we were able to transcend the various levels of our data sets organised according to these grids of interpretation. This demanded a very high level of thought, not only in constructing the schemes but in using them to analyse the data as well. Using the Framework Schemes required simultaneous multi-level thinking throughout the analysis which we found rewarding but very challenging.

Research design and the nature of data:

The most challenging phase of our research was the data collection phase. After two observations and three interviews, we discovered that neither direct observations nor face-to-face interviews were yielding meaningful data. What we observed in the two observations we made were processes of decision-making, rather than decision justification processes. With the face-to-face interviews, the third respondent explained after the interview that what he had just told me was what *ought* to have been happening and not what was actually happening. One wondered as to how best one could go about in accessing what was actually happening. Having decided in advance that one would use an interpretive approach in analysing the data, this was a serious setback in our research design. One had to pause for while and once more look at the literature for alternatives. It was the literature on hermeneutics that pointed to other accepted and valid forms of data within the interpretive tradition (see section 5.1 of chapter 5). One of these accepted forms was *documentary artefacts* - written accounts by respondents. We were comfortable with this form and decided to use an open-ended survey-like questionnaire, which we sent to selected organisations. By hindsight, the notion by a respondent that group decision justification *ought* to have been happening in a particular way was a good

motivation for the decision justification social practice we propose. Data collection with regard to GSS use went according to plan, except that students were used as subjects within a laboratory setting. While many researchers in GSS have used students as subjects in laboratory experiments, Introna and Whitley (1999) have presented a very valid critique of the general validity of such results. We have acknowledged these limitations elsewhere (Phahlamohlaka and Roode, 2001), but due to the limited use of GSS technology in the South African context, we could not think of any viable alternative. In addition, Nunamaker *et al.* (1991) noted that foregoing laboratory research in favour of an exclusive focus on field research is not a viable answer, given the difficulty to assemble groups, measure phenomena, and assign cause and effect in the field.

6.9 *Evaluation of research:-Klein and Myers' set of principles and our evaluation guidelines*

Klein and Myers' set of principles

Klein and Myers' (1999) summary of principles for the conduct and evaluation of interpretive field research were presented in section 4.4 of chapter 4. Since our entire analysis is based on an interpretive philosophy of a hermeneutic nature, explicating how each of the principles applies to our research will amount to an unnecessary repetition. The authors point out that the fundamental principle of the hermeneutic circle is fundamental to all the other principles. The principle of the hermeneutic circle underpins our analysis framework. It follows therefore that all the other principles applies and could be used as a *checklist* of our arguments through all the chapters, starting with the literature study in chapter 2, the choice of the research method in chapter 3, the construction of the analysis framework in chapter 4 as well as the research design, data, and the interpretation thereof in chapter 5. The principles informed our entire research and trying to itemise and explicate them here would be pointless. We can perhaps just point out that principle 4 (The Principle of Abstraction and Generalisation) manifests

itself through the decision justification social practice, emanating from the application of the analysis framework in interpreting the data. What we wish to discuss are the guidelines that we have set which in our view, needs to be considered by the evaluator of this study.

Evaluation guidelines of this study from the authors' point of view

Evaluation guidelines of theses are normally prescribed by examiners in accordance with set academic standards. It is the responsibility of the author to ensure that such set evaluation standards are met. We have not seen studies similar to ours where authors have suggested evaluation guidelines in order to complement those set by examiners. We believe that this is an omission and suggest that authors assist examiners by prescribing their own guidelines and then explaining to the examiner how they have met those

guidelines in their study. We hope to achieve that in this section. Without discussing them, we have prescribed in section 4.4 of chapter 4, the evaluation guidelines of our study as the following:

The significance of the problem being studied and the research purpose.

The philosophical foundation, the appropriateness of the research method and the analysis approach.

The extent to which the research framework enable both the researcher and the decision-making group to obtain a deeper insight in the decision justification process through interpretation.

The extent to which the use of existing theories in combination illuminate various aspects of the decision justification process.

The extent to which the framework enable the identification of areas where the theories

in use are more helpful and where they are not, thus an enhanced understanding of the theories themselves.

Whether the research questions raised have been satisfactorily responded to.

Each of these guidelines is separately discussed.

The significance of the problem being studied and the research purpose:

Theoretical and empirical evidence suggest that a great deal on decision theory and the process of decision-making could have been learnt had the concept of decision justification been simultaneously considered in such studies. The fact that decision theorists did not pay attention to the concept of decision justification mean that the

available decision support systems are meant to support decision-making, and not the justification of such decisions.

Although not all decisions require to be justified, there are many instances in our day-to-day lives when such justifications are called for. For this reason, the significance of the problem addressed in this study does not only pertain to the contribution it makes to practical philosophy, but to decision theory in general and in particular, to group decision-making and group decision support systems.

The research purpose of this study has been stated 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.

To identify, describe and interpret the possible implications brought about by this

justification process for GSS use and design ideals.

We are satisfied about the extent to which this purpose has been served. The earlier parts of this chapter were devoted to showing the outcomes of this pursuit.

The philosophical foundation, the appropriateness of the research method and the analysis approach:

We have clearly stated the philosophical foundation underpinning this study together with the research method and the analysis approach in chapters 3 and 4. The interpretive and hermeneutic philosophies as well as a hermeneutic mode of analysis embedding other theories that are compatible with the interpretive tradition were followed.

The extent to which the research framework enable both the researcher and the decision-making group to obtain a deeper insight on the decision justification process through interpretation:

The hermeneutic nature of the framework is such that not only the researcher is capable of using it to interpret the text as it is produced by the decision-making group, but the group members themselves are enabled to engage each other in sharing perspectives through the hermeneutic circle. Toulmin *et al.*'s schema of reasoning which is the locus of the framework guides the justification process as the hermeneutic process continue. The GDJS explained earlier would be more helpful to the decision-making group while Framework Schemes, Grids of interpretation and Scripts proved useful as interpretive schemes by the researcher.

The extent to which the use of existing theories in combination illuminate various aspects of the decision justification process:

The use of various theories in looking at empirical data enabled multiple interpretations.

Evidence from empirical data shows that groups use various forms of processes and schemes to justify their decisions. Making sense of these processes would have been difficult from a single theoretical perspective.

The extent to which the framework enable the identification of areas where the theories in use are more helpful and where they are not, thus an enhanced understanding of the theories themselves:

This was the main achievement of our analysis framework both in terms of the analysis of empirical data itself and the outcome thereof. The Framework Schemes, Grids of interpretation and Scripts which were used for the analysis were designed in accordance with identified theories or specific research approaches such as thinkLets and symbolic interaction. Practical outcomes includes the GDJS and the new decision-making

paradigm for DSS in decision justification environments explained earlier.

Whether the research questions raised have been satisfactorily responded to:

Responses to the four primary research questions were sought from the literature and empirically. At the empirical level, secondary questions were raised in accordance with the process-based research framework (Roode, 1993) and analysed using the analysis framework we have developed. A close analysis of the components of Toulmin *et al.*'s (1979) schema of reasoning and its application revealed a mapping between these components, the components of the process based research framework (Roode, 1993) and the four essential elements of any complete theory as proposed by Whetten (1989). As part of showing how the research questions were responded to, we presented such a mapping in the last chapter, but due to its relevance in the next section, it is briefly revisited.

6.10 *Assessing the contribution of the study*

What this study has demonstrated is that adding the concept of justification to the decision-making process significantly alters our understanding of the decision-making phenomena. It also changes our understanding of decision theory and imposes a particular requirement on the design of group decision support systems. For instance, it reinforces Claudio Ciborra's (1999) argument for designing systems which constitute a shared context for interpretation as well as those which can support reflection-in-action and learning for what he calls smart improvisation. We have outlined such design ideals in the last chapter and in Part VI of this chapter. They are ideal in the sense that they require a design based on hermeneutic dialogue. Theoretical insights, according to Whetten (1989), comes from similar demonstrations. Whetten (1989), identifies four essential elements, viz., "what", "how", "why" and "who, where and when" as constituting the building blocks of a complete theory. "What" addresses which factors,

i.e., variables, constructs or concepts, should be considered in the attempt to explain a social or individual phenomenon. Inclusion of the "right" factors is judged according to their "comprehensiveness", or whether all relevant factors are included, and "parsimony", or whether irrelevant factors can be removed. "How" addresses how the identified factors are related. Together the "what" and "the "how" elements constitute the subject or domain of the theory. The "why" element motivates why the factors have been selected by identifying the underlying psychological, economic or social dynamics which justify this selection. This is required to motivate why colleagues should give credence to the particular representation of the phenomenon under scrutiny. The three elements provide the essential ingredients of a simple theory, i.e., description and explanation. "What" and "how" describe, and "why" explains. "What" and "how" provide a framework for the interpretation of empirical observations. Combining "whats" and "hows" provide typical models from which testable propositions can be derived. The mapping presented in Figure 6.3 (previously Figure 5.1) demonstrates how the elements as proposed by

Whetten (1989) naturally combine with those of Roode's (1993) process-based research framework to inform a justification approach based on Toulmin *et al.*'s schema of reasoning and underpinning the GDJS.

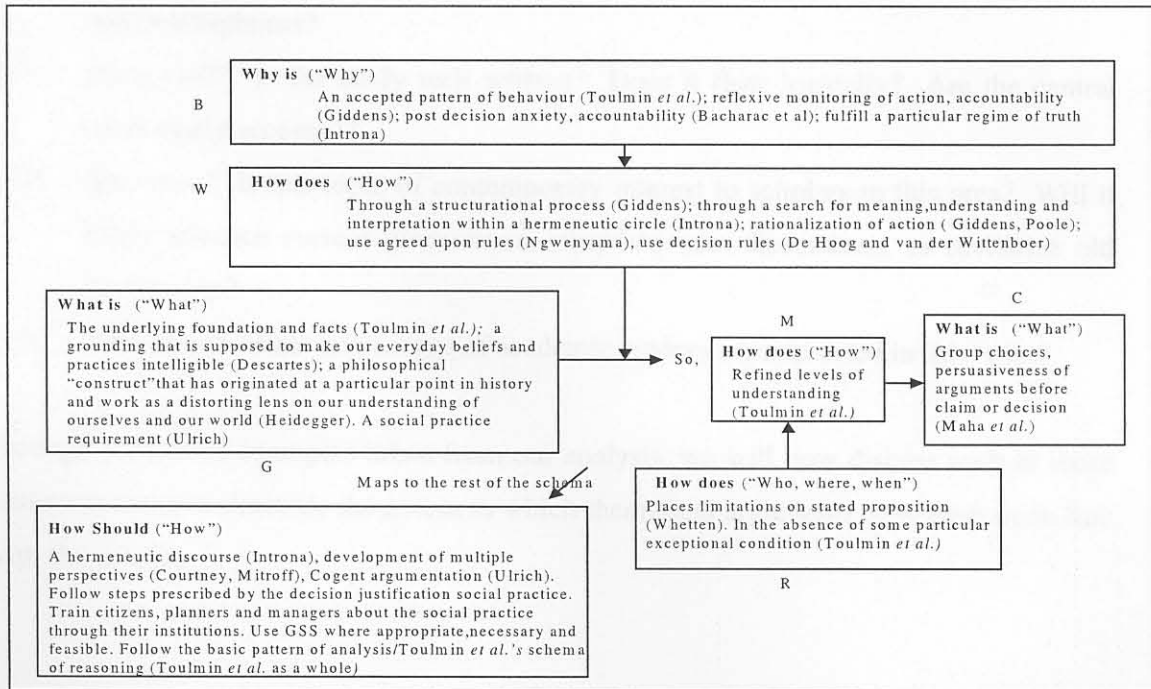


Figure 6.2 (previously Figure 5.1): A mapping of the process-based research framework (Roode, 1993), elements of any complete theory (Whetten, 1989) onto Toulmin *et al.*'s schema of reasoning- Responses to our research questions.

The GDJS and the new decision-making paradigm for DSS within the decision justification environments are typical models from which testable propositions can be derived. It was in response to the “what” question that the decision justification social practice and its theoretical framework proposed in this study came into being.

Although we have already presented and discussed what the evaluator of this study should specifically look for, Whetten (1989) and Introna (1992) have formulated equally valuable, more general criteria which can be used to assess theoretical contributions of a study. There is a considerable overlap between the two criteria. We could use any of

them to complete the assessment of the theoretical contribution made by the study, but since we have already described a mapping of our research questions and an inquiring approach to the four essential elements of a theory proposed by Whetten, we will use Whetten's criteria.

Whetten's (*op.cit.*) criteria is in the form of questions which are often asked in judging theoretical contributions of a study. There are seven questions which he lists in order of importance as follows:

- (I) *What's new?* Does the study make a significant, value-added contribution to current thinking?
- (II) *So what?* Will the study likely change the practice of science in this area? Are linkages to research evident (either explicitly laid out, or easily, reliably deduced)?
- (III) *Why so?* Are the underlying logic and supporting evidence compelling? Are the author's assumptions explicit?
- (IV) *Well done?* Does the study reflect seasoned thinking, conveying completeness and thoroughness?
- (V) *Done well?* Is the study well written? Does it flow logically? Are the central ideas easily accessed?
- (VI) *Why now?* Is this topic of contemporary interest to scholars in this area? Will it likely advance current discussions, stimulate new discussions, or revitalize old discussions?
- (VII) *Who cares?* What percentage of academic readers are interested in this topic?

Through the use of examples taken from our analysis, we will now discuss each of these criteria in order to illustrate the extent to which theoretical arguments presented are in line with the criteria.

(I) *What's new? Does the study make a significant, value-added contribution to current thinking?*

The problem of practical reason, which encompasses the concept of justification is itself not new. It continues to receive the attention of practical philosophers. What is new is the new theoretical insight on group decision-making and group decision support systems when group decisions have to be justified. We now know that the often assumed competence of actors in those circumstances is not sufficient and needs to be enhanced so that those involved and those affected can judge for themselves that the decisions made are reasonable. We know too that the design of group support systems to support this justification process should be through a hermeneutic dialogue. The study also reveal that there is a current thinking on GSS research which moves away from a focus on GSS technology to a focus on users interaction and patterns of thinking. Two new models, the GDJS and the new decision-making paradigm for DSS in justification environments together with a new construct, the decision justification social practice, emerged from the study. These are all significant and value adding and radically changes the current thinking in both decision theory and group decision support systems.

(II) *So what? Will the study likely change the practice of science in this area? Are linkages to research evident (either explicitly laid out, or easily, reliably deduced)?*

As the world yearns for democratic ideals, 'good governance', 'transparency', 'accountability', 'participatory decision-making' and other similar notions that reflects the general desire for a common good, evidence is beginning to emerge that the importance of the decision justification social practice will increase world-wide. A typical example is what is currently happening in South Africa. Completion of this study coincides with the introduction of a code of Good Administrative Conduct (Section 10 (e) of the promotion of administrative justice act, 2000 (Act No. 3 of 2000)).

The Act:

- (a) Sets out the rules and guidelines that administrators must follow when making decision;
- (b) Requires administrators to give reasons for their decisions;
- (c) Requires administrators to inform people about their rights to review or appeal and to request reasons; and
- (d) Gives members of the public the right to challenge the decisions of administrators in court.

These requirements amounts to a prescribed social practice to administrators about procedures of decision-making when such decisions are likely to negatively affect others. It is indeed an example of a decision justification social practice for administrators in the South African public service. Insights from this study would not only contribute to a better understanding of processes such as this, but could also assist in the design of information systems aimed at supporting them. For instance, administrators could use the Group Decision Justification Framework in their decision-making process in anticipation for a possible challenge or just to ensure that they remain within the requirements of the code. This represents a clear change in the practice of decision-making. The practice of designing support systems for this new way of decision-making has to be a learning process for both the designer and those to be supported by the system. Figure 4.12 - implications for the decision justification social practice on the new decision-making paradigm for DSS; Table 6.1 - a theoretical framework for decision justification social practice; Figure 6.1 - the Group Decision Justification Schema (GDJS) and Figure 5.4 - Group Decision Justification Framework all show linkages of this study to research. In addition, a new line of inquiry closely related to this study is presented by Turoff *et al.* (2002). They provide a statement of the requirements for and some design examples of what should constitute a Social Decision Support System (SDSS). The design ideal of such a system embodies the hope that modern human networking technology can be configured and used to allow the emergence of a collective human intelligence by very

large groups of individuals. This study, together with similar studies such as the one just cited are likely to change group decision-making processes and the design of the accompanying computer-based systems aimed at supporting these processes.

(III) *Why so? Are the underlying logic and supporting evidence compelling? Are the author's assumptions explicit?*

The underlying logic and supporting evidence to our study is contained in the analysis framework. By closely following arguments from the literature, we were able to construct the framework. Research questions were formulated, enabling us to collect data

which we interpreted in a systematic way using the analysis framework. Two GSS use sessions were also analysed using the framework. Our assumptions are contained in the philosophical position which we explicitly stated in chapter 2 and in section 3.3 of chapter 3 - indicating that we consider the need for decision justification as an essential component of every group-decision making process. Our analysis reveal that although not all decisions need to be justified, groups mostly make decisions which have broad social implications and therefore mostly need to be justified. A quick re-look at the table of morphological fields [Table 5.1 Consolidated Morphological Fields] and the accompanying morphological graphs together with the interpretations thereof presented in chapter 5 reveals empirical evidence to support this.

(IV) *Well done? Does the study reflect seasoned thinking, conveying completeness and thoroughness?*

The multi-dimensional nature of the topic suggests no other route, but that based on seasoned thinking. It required multiple interpretation and multi-level analysis which could only be achieved through thorough thinking. This is reflected in the manner in which the framework schemes based on various theories were constructed and used in analysing empirical data. The data itself was obtained through the application of a

process based-research framework which entails looking at the research problem from various perspectives, ensuring completeness. The outcome of the analysis process is the Group Decision Justification Framework (Figure 5.1 in chapter 5), which encompasses a decision justification social practice.

(V) *Done well? Is the study well written? Does it flow logically? Are the central ideas easily accessed?*

The central ideas in the study comes from practical philosophy and are motivated by our interest in decision theory and group decision support systems. Easily accessible and extensive literature on each of these areas exist and have been sufficiently explored in the

study. After introducing the topic in chapter 1, we explored the literature in chapter 2

followed by a discussion of research methods as well as how and why we have arrived at the choice of the research method that we made. Based on the literature, we constructed an analysis framework which we used to interpret the data. A theoretically well established process was used in obtaining the data for the first part of our research purpose while two GSS use sessions were used for the second part. Using an interpretive analysis of a hermeneutic nature reflected in the analysis framework, we performed an extensive interpretation of the data. The literature together with an understanding which emerged from the interpretation enabled us to propose a theoretical construct - the Group Decision Justification Framework

(VI) *Why now? Is this topic of contemporary interest to scholars in this area? Will it likely advance current discussions, stimulate new discussions, or revitalize old discussions?*

This thesis argues that the concept of decision justification should accompany any form of group decision-making and that it was an omission that decision theorists did not pay

much attention to it. Decision-making models such as those of Simon (1976) have greatly influenced major areas of the information systems field, such as Artificial Intelligence (AI), Decision Support Systems (DSS) and Management Information Systems (MIS). Both Weber (1964) and Simon (1976) argue that the meaning of the decision can be traced in the objective circumstances, in the value premises and preferences of the actor, in the act of selecting alternatives, and so on. This partly explains why the need for decision justification was ignored in traditional decision theory. Instead, the idea attracted much attention from practical philosophers such as Jürgen Habermas, David Gauthier (1986), Michel Foucault (1977), Thomas Kuhn (1970), Stephen Toulmin (1979) and phenomenologists such as Schutz (1967) and Garfinkel (1974) who take different positions from those of Weber and Simon.

The arguments presented in this study are rooted in practical philosophy but closely align with those of phenomenologists who argue that the *in-order-to* component in rational decision-making is just the tip of the iceberg (Garfinkel, 1974). Below, there are the actor's past experiences - selectively evoked according to the existential circumstances valid at the moment of making the decision. These are constitutive meanings - the *because-of* component of the action which can explain the reasons why and how a situation has been perceived as problematic in the first place (Ciborra, 1999). The decision justification social practice is aimed at assisting the decision makers as well as those affected by the decision to access these *because-of* components, which are only selectively and circumstantially evoked. Because the topic originates outside the information systems field, interest is only beginning to emerge. Needless to mention its central role in practical philosophy and contemporary liberal-democratic political theory (D'Agostino, 1997).

(VII) *Who cares?* What percentage of academic readers are interested in this topic?

Two papers addressing different aspects of this topic have been reviewed by academic readers in the information systems field. The first was favourably considered and was

presented at the European Conference on Information Systems (ECIS2001). It was also requested by one of the leading researchers in the area of Group Support Systems (GSS) who remarked that the topic was very interesting. The second has recently been accepted for presentation at the Human-Computer Interaction International Conference (HCII2003). Three reviewers rated it exceptionally high, once more indicating the level of interest that the topic is beginning to attract in the information systems scholarship.

6.11 Limitations and Further research

Limitations

While discussing the critical reflections in section 6.8, we pointed out some of the limitations of this study and acknowledged them appropriately. Key limitations have to do with our research design and data collection. The first set of limitations is that the nature of our topic did not allow for data collection through direct observations. Initial face-to-face interviews yielded unsatisfactory data and was abandoned in favour of a survey-like questionnaire. These limitations were extensively discussed in chapter 5. The second limitation is the fact that for the second leg of our research, we have used students as subjects in a laboratory setting in a study which ideally should have used a field study. Once more, reasons which we regard as adequate have been given. None of these limitations were found to be out of step with reported work on interpretive IS research of a hermeneutic nature and GSS.

The third is not so much a limitation but our own philosophical position on the concept of decision justification. We took the position that it is in the interest of a 'common good' that those entrusted with the responsibility of making decisions on behalf of others should be able to justify such decisions when asked to do so. This position was supported by the literature and is in line with democratic ideals which we perhaps mistakenly assume is a world-wide human endeavour. It may well be the case that there are societies or even communities which do not share this ideal. Therein comes the limitation of this study –

for in such societies and communities, the contribution that this study could make would be minimal, if at all. We take comfort in the knowledge that at least in the country in which this study is conducted, such ideals are dearly cherished.

The fourth and last limitation is the nature of our analysis framework. We used various theoretical lenses to look at the empirical data. Because of this, we have mostly seen what the theories suggest, although a conscious effort was made throughout to allow the data to directly talk to us, rather than only through the theoretical lens. Using hermeneutics as a mode of analysis mean that we took a textual view of the world, thereby acknowledging that there is an infinite number of interpretations of any text (White and Taket, 1994). Perhaps Derrida (1978, p. 292), who view interpretation as *play* may assist in accentuating this limitation: ‘a world of signs without fault, without truth,

and without origin which is offered to an active interpretation’. We believe, however, that if decision justification is taken as the focal concept, then other interpretivists will be able to make sense of the data and our interpretation. In order to cater for this, we have included all empirical data in the main body of the thesis.

Further Research

At a theoretical level, the first area of further research could be to revisit various decision theories with the concept of decision justification in mind. In particular, one could analyse Weber’s and Simon’s models assuming a decision justification social practice. One could introduce the concept of decision justification into these models and inductively re-assess their explanatory power of the decision-making process. Since these models have to a very large extent informed the designs and development of decision support systems that we have today, studies on the possible development of decision justification support systems along the lines of a new decision-making paradigm for DSS proposed by Courtney (2001) could be undertaken.

The second area of possible further research could be to test the possibility of using Toulmin *et al.*'s (1979) basic pattern of reasoning (schema) as a thinkLet (Briggs *et al.*, 2001). Results from this study suggest that this line of inquiry may theoretically and practically enrich GSS research. For example, although performed outside the scope of this thesis, we have used a point-counterpoint thinkLet during a GSS session in a decision justification environment guided by Toulmin *et al.*'s schema. The preliminary results are pleasing and seem to indicate that the use of this particular thinkLet may accelerate the pace of the decision justification process. There are indications too that the use of tight *scripts* may enhance a better understanding of the requirements of the elements of the schema, thereby increasing the clarity of the justification process.

The third area could be the testing of the proposed Group Decision Justification Framework in various practical contexts involving facilitated sessions in which groups are encouraged to practice the decision justification process. In the South African context, this could be achieved through aligning the study with the implementation of the new code of Good Administrative Conduct (Section 10 (e) of the promotion of administrative justice act, 2000 (Act No. 3 of 2000)) through the Department of Justice and the Department of Public Service and Administration. The study could include the development of a training programme for a decision justification social practice including GSS use in support of the process.

The last area of research could be technical, involving the design and development of a generic Group Decision Justification Support System (GDJSS) for the South African public institutions. However, this could only be sensible once the code of Good Administrative Conduct is in operation.

6.12 A final word

This research used an extensive literature review which lead to the development and use of a multi-theoretic analysis framework to study and better understand the process of group decision-making when group decisions have to be justified. Based on this enhanced understanding, we were able to identify, describe and interpret the implications for GSS use and design ideals brought about by this justification process, thereby attaining the intended purpose of the study. We have developed a theoretical framework for a *decision justification social practice* and a *Group Decision Justification Schema* (GDJS) which together, constitute a *Group Decision Justification Framework*. Through the use of *Grids of Interpretations* and *Strips* within theoretically informed *Framework Schemes* bound by a hermeneutic circle, we made chaos look like order (Mumford, 1991). Through the *Framework Schemes*, we created a way of seeing and a way of not seeing - a coherent interpretive analysis of empirical data. Notwithstanding the limitations discussed above, we submit that this study makes both a theoretical and a practical contribution to interpretive IS research. For the sake of pleasing Foucault (quoted in Dreyfus and Rabinow, 1982), our final word is that "... because all interpretation is arbitrary, there can be no final interpretation".

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