Defining the Human Resource Processes Required to Support World Class Manufacturing

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School of Engineering Management
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The author would like to thank :

Johan Strümpfer, for his guidance and help as supervisor during the evolution of this project,

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DEDICATION

I wish to dedicate this half dissertation to my parents, Derek and Jane, and to my brother, John.

Table of Contents :

List of Figures

List of Tables

INTRODUCTION

This half dissertation forms one half of a Master's degree, the other half being four taught courses.

Whilst working as an assistant lecturer in the Department of Mechanical Engineering at the University of Cape Town, the author also studied for an M.Sc. on the 'Operations Management Development Programme', run by the School of Engineering Management. The programme focuses on industrial project work and thus the author teamed up with a local company prepared to participate in project work and needing the project to be undertaken.

The author made a deliberate decision to choose the 'softest' approach available in selecting the methodology for his half dissertation. He felt that dealing with softer issues was a specific weakness, having been educated in engineering at undergraduate and postgraduate levels. Soft systems methodology proved the appropriate choice.

This half dissertation was carried out with a local textile Company : the Managing Director of which had studied at the School of Engineering Management. Initial contact was made with the company in July 1995 and meetings were held for approximately half a day every two weeks thereafter. The final meeting took place at the beginning of February 1996.

SYNOPSIS

The aim of this project was to use soft systems methodology (SSM) in an industrial environment to tackle an unstructured problem. An agreement was made with a local company that the project would be of benefit both to them and the author.

Whilst the aims of the project were initially defined (see Appendix 1), the use of SSM entailed surfacing the issues without a pre-defined area of concern. The project involved two main groups from the company. Group 1 was the HR2000 committee (a group that had already been formed by the company to lead the initiative to bring the organisation's human resources towards an, as yet undefined, goal in the year 2000). Group 1 would be directly involved in the project. Group 2, the manufacturing line managers, would be kept fully informed throughout the process.

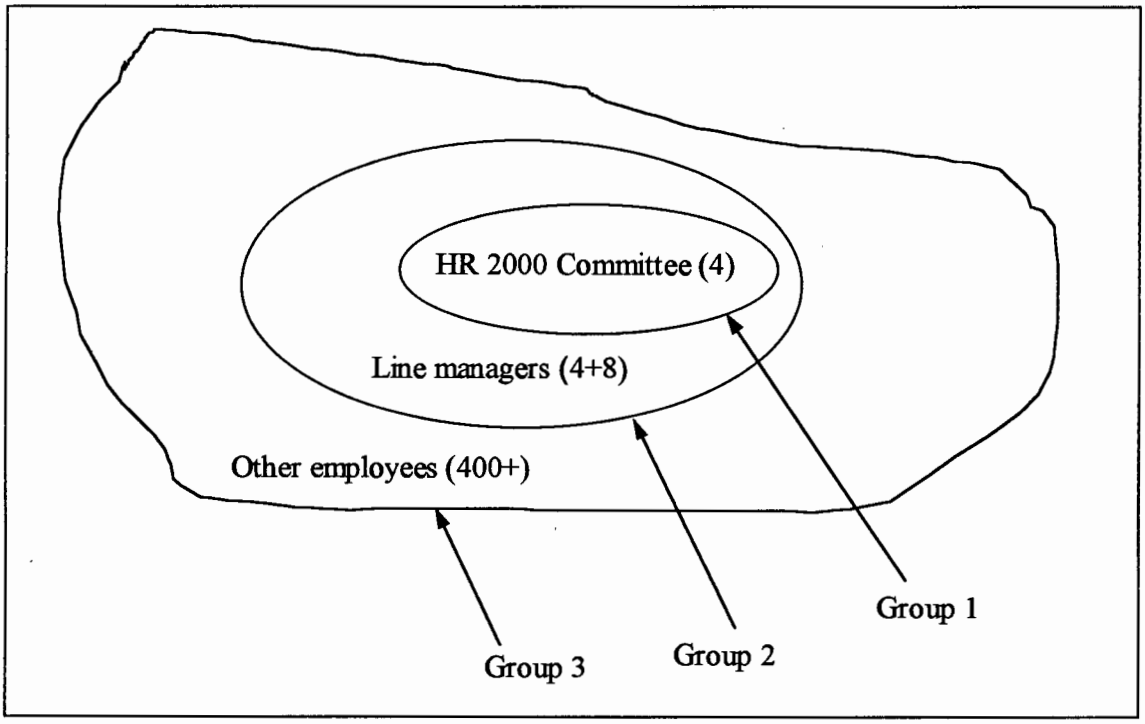

Figure 1 - The Involvement of Company Members in the Project

This document has been written to record the project and has been constructed in three main chapters, see Table 1 and Figure 2.

Table 1- The Structure of the Report

Chapter	*Title*	*Description*
1	A Conceptual Framework	The first chapter lays a conceptual framework within which the project was carried out. This deals with the generic stages of an enquiry as a framework within which other theoretical elements of the project can be placed. The systems thinking paradigm is described, as a base from which to explore soft systems methodology and systems dynamics modelling, both of which will be used in the project. The ideas about enquiry and SSM are then shown to be mutually supporting and non contradictory. Finally the elements of the chapter are synthesised to form a conceptual framework for the practical element of the project.
2	SSM in Action	The second chapter records the details of the project with the Company. The project is presented as a sequential application of the methodology, from Stage 1 to 7.
3	Reflecting on the Project	The third chapter reflects upon and synthesises the main learning and conclusions from the project.

The project has resulted in the company adopting the findings and using them as the basis of the HR2000 programme. The aim of this programme is to develop the human resources processes of the organisation to be suitable for a world class manufacturer by the year 2000.

The programme consists of six main initiatives (see Figure 3 - The Six Initiatives), which can be seen to be targeted at different levels within the organisation. The interventions labelled remuneration, training, regstellende aksie[a] and communicating-

[a] Regstellende Aksie literally translated from Afrikaans means putting things right. The phrase is used as it implies a more holistic approach to correcting the injustices of apartheid than the more widely used label of affirmative action.

the-bigger-picture are all targeted at the individual within the organisation. The teamwork/involvement project focuses on attempts to integrate individuals into an effective team. The last project, business planning, aims to focus the efforts of the individuals and teams on a common goal of achieving a successful future.

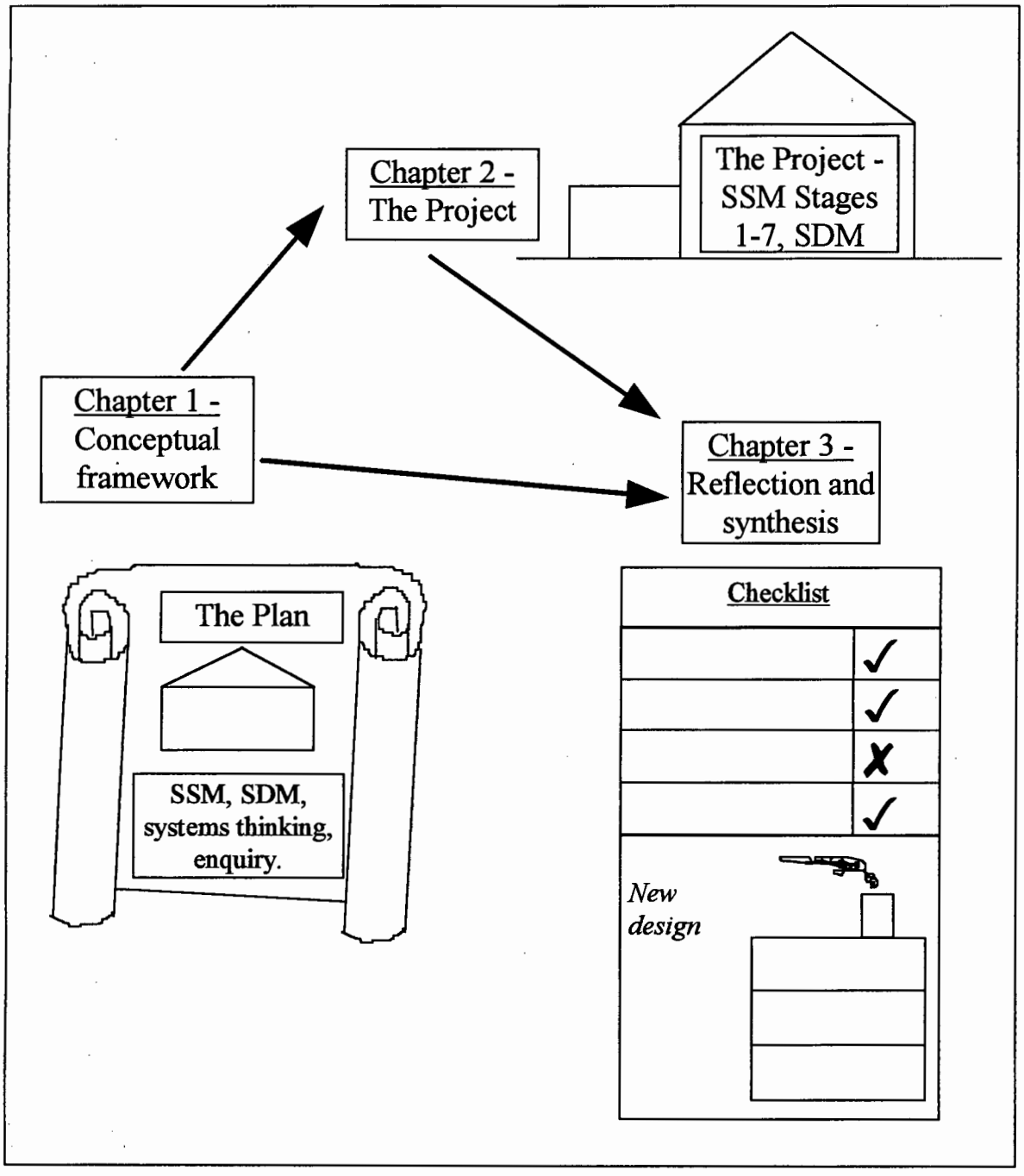

Figure 2 - A Rich Picture of the Structure of the Report

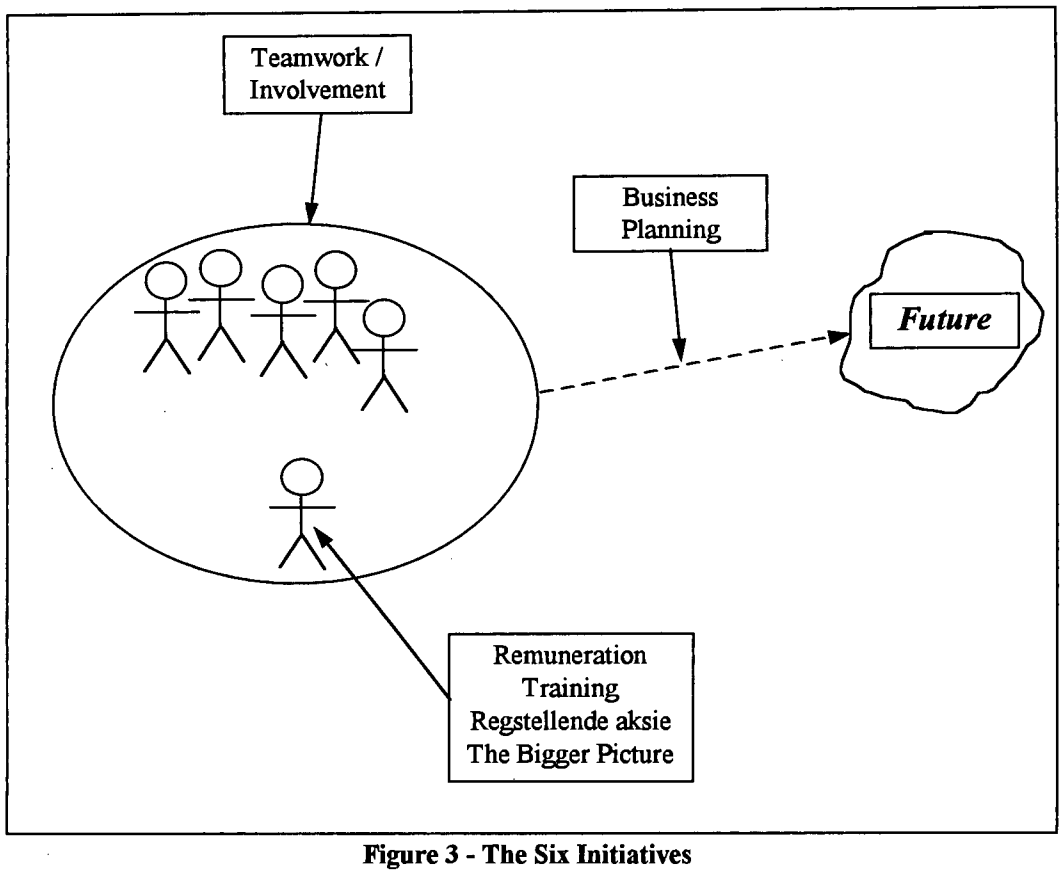

Figure 3 - The Six Initiatives

The HR2000 committee has the responsibility to ensure that resources are allocated to the proposed interventions and that they will be carried out to the agreed time scales. In effect, it will become a monitoring and co-ordinating body. Each project will be allocated a project team and given a remit (taken from Section 1.3.5) and a deadline.

Resources have already been allocated to progressing the HR2000 programme as a whole, the lady who participated in Group 1 has been devoted half time to facilitating and co-ordinating the project. Four of the six initiatives had started by April 1996. The line managers have started meeting on a two weekly basis to commence the teamwork/involvement project. The communicating-the-bigger-picture project began by showing all employees a video of Nelson Mandela's recent interview with the SABC[b] on his 'state of the nation' 1996 address and an existing communication forum, the quality stage, is now being used to communicate wider issues, including financial

[b] SABC - The South African Broadcasting Corporation

information. The regstellende aksie initiative has identified 15 individuals who wish to finish their secondary education and 10 promising prospects who are to receive accelerated development. The management team spent a weekend together to discuss short and long term strategic issues. The other projects are scheduled to start in the first half of 1996.

In summary, SSM offered a way to legitimise and rigorously deal with the multiple perspectives that existed within the organisation. This step, of acknowledging and discussing mutually opposed views was, in itself a major step forward. SSM gave a non-threatening framework within which contentious issues could be discussed and learned about. Using SSM to explore the different views, deepened the understanding of the different perspectives surrounding the various issues that were discussed. The process of discussions and the resulting learning enabled the real issues to be brought to the fore and an agreement to be reached about specific actions that would indeed address the perceived problems.

1. A CONCEPTUAL FRAMEWORK

The Operations Management Development Programme run by the School of Engineering Management at the University of Cape Town, adopts and promotes sound philosophies, systems thinking based methodologies and techniques in the core areas of its work. This dissertation will develop such a framework to justify systems thinking compared to other types of thought for a particular application.

In this chapter, a philosophical framework will be built, within which three main themes will be integrated.

The first section describes a generic model of enquiry. The perspective of a 19th century philosopher, Charles Peirce, on the scientific method will be referred to extensively, as his writings are considered to be remarkably systemic.[c]

The second theme demonstrates where the concepts of systems thinking originate and justifies why they form a better framework for thought than more traditional types of thinking, which will also be discussed.

The following three sections detail two methodologies which have emerged from the systems thinking movement : The first methodology, soft systems methodology, has been specifically developed to deal with softer issues (Soft issues arise where defining the problem to be solved is itself problematical, due to differing perspectives on what the problem really is.) The second, systems dynamics modelling, is used to explore interactions over time.

The final section of this chapter integrates the preceding five to present a theoretical framework that was used to carry out the project. Figure 4 shows the development of this chapter.

[c] From discussions with Associate Professor Tom Ryan, Director, School of Engineering Management, University of Cape Town.

This chapter therefore presents a framework which was used to carry out the project and which can be used to assess the practical work which is presented in Chapter 2. Chapter 3 reflects on and assesses the project in the light of the conceptual framework presented here.

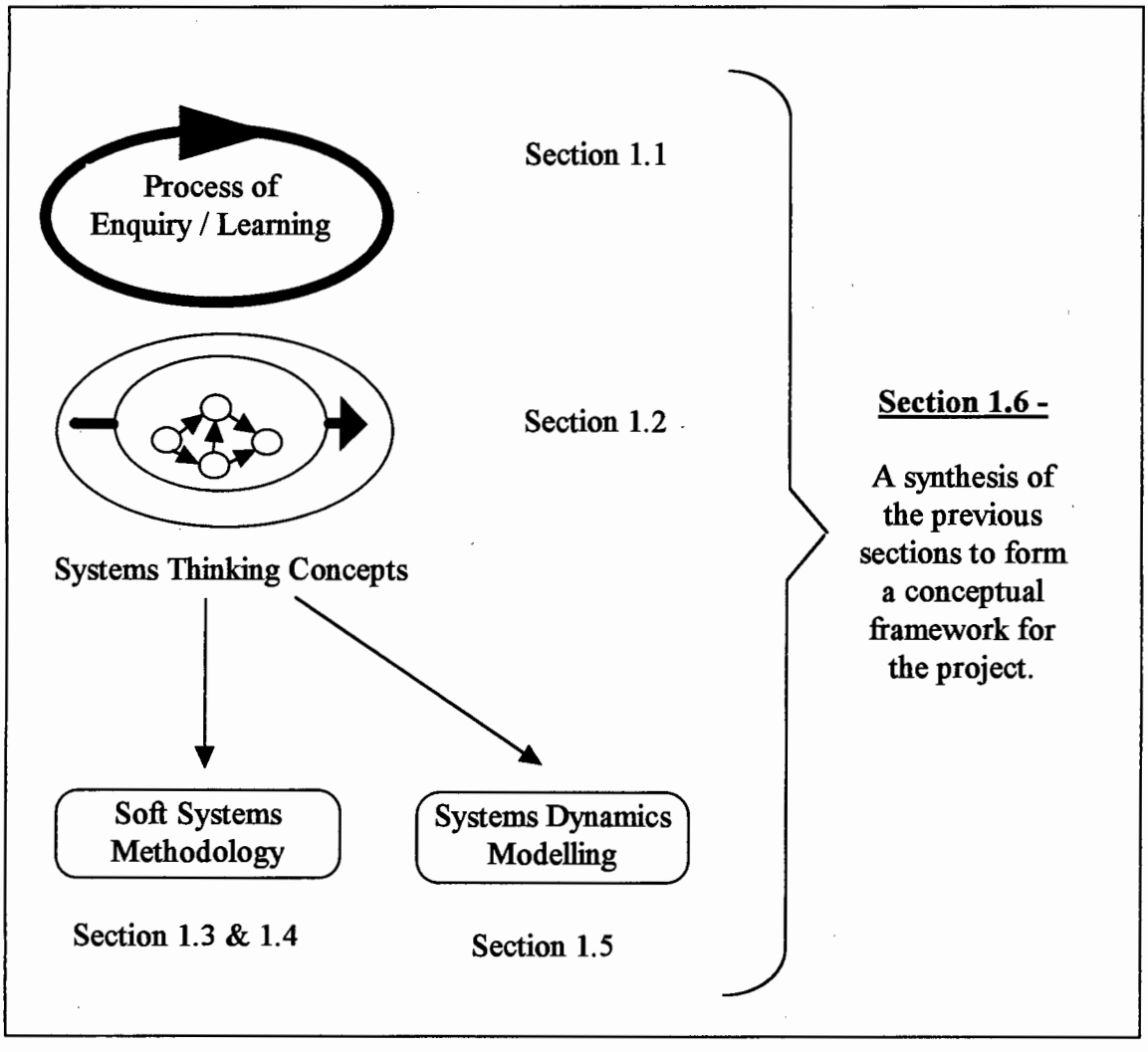

Figure 4 - The Structure of Chapter 1

1.1. Enquiry as Learning : A Peircean Perspective

This first section will develop a general framework for any enquiry process. The following sections of this chapter will then describe the other theoretical elements of the project. The final section will integrate the theoretical parts into the general framework of enquiry which will form the conceptual base for the practical element of the project.

Different authors[1,2] have proposed their own interpretations of the methods of scientific enquiry. For the purposes of this dissertation, Charles Peirce and Charles Handy have been chosen as reference authors. Peirce's description of enquiry has been chosen as his work is considered to be based in a systems thinking framework[d]. Charles Handy provides a neat summary of the process of enquiry which Peirce describes in detail.

1.1.1. The Fixation of Belief

In order to take action one must believe that the actions will produce the desired effect. The state of belief can be challenged, if actions do not result in the desired or expected consequences. The surprise that an unexpected result generates will initiate a process of enquiry aimed at returning to a state of belief. Figure 5 illustrates this process.

In his article 'The Fixation of Belief'[3], Peirce, explores four different ways that belief can be reached :

(a) **Tenacity** for fixing belief is when "what they are saying" is repeated so many times that it becomes a belief. '*It begins with a viewpoint, capriciously formed. Perhaps this was something learned at mother's knee; it might have been revealed by a sailor in the pub; or it is an idea culled from this morning's*

[d] From discussions with Tom Ryan, Director, School of Engineering Management, University of Cape Town.

newspaper. Typically, it is what 'they' are saying (and they ought to know). At this stage, the viewpoint has no special merit for the man who expresses it, for its causal origins are understood - it is not a belief. However, it is brought out - and increasingly brought out - to be aired. Gradually it becomes inculcated as a habit of thought : eventually it is indeed fixed as a belief.' [4]

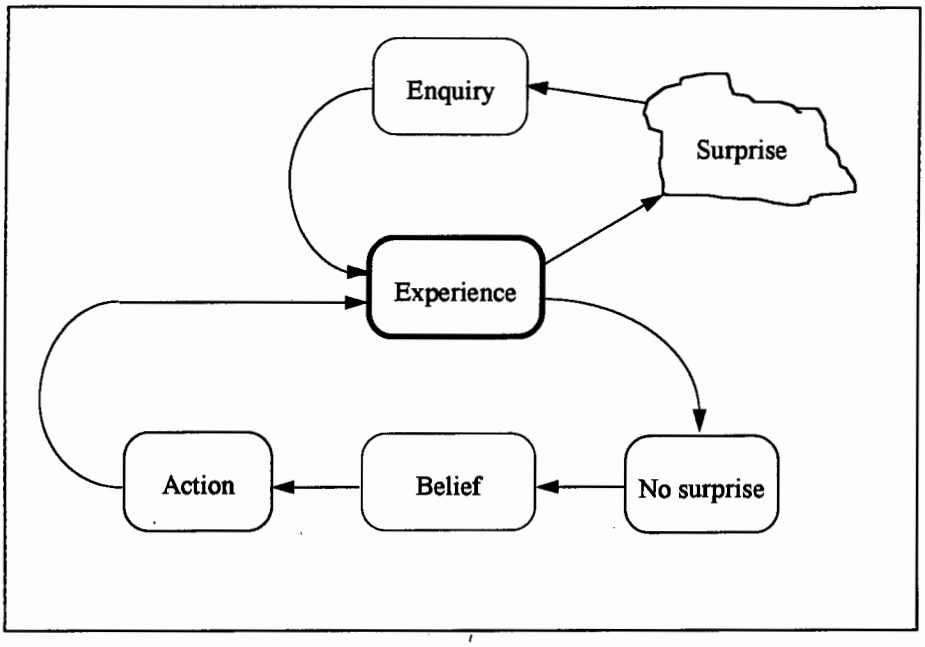

Figure 5 - The Scientific Method : A Summary

(b) **Authority** : *'The second method of fixing belief is the one widely adopted by groups of individuals who attempt to control the beliefs of individuals by coercive means. Peirce uses the word state as the controlling body, but this would mean any group of individuals who fix belief in this way. He defines state as any institution created for the purpose of maintaining "correct" (interpreted in its most subjective manner) doctrines for the intellectual consumption of its constituency. Having defined these doctrines the next objective is to re-iterate them, perpetually....The whole process is designed to shroud the individual in ignorance, with the expressed goal of circumventing the tendency of individuals to think of contrary issues which do not concur with the official view.'* [5]

(c) **Apriority** : The third method of fixing belief is to use an *a priori* argument: *'An a priori argument in logic is one which begins from a set of*

axioms which are presumed to be true, rather than from experiences that have been undergone. Some philosophers have argued that such axioms are innate in the mind, that they existed prior to experience (hence the name). The practice of this kind of reasoning is called apriori....But whatever the philosophical issues, it is certainly the case that people do in real life produce all kinds of arguments which begin with unexpressed assumptions that they take to be self evident.' [6] The subtlety of this method is '*it does not mean that which agrees with experience, but that which we find ourselves inclined to believe.'* [7]

(d) The **scientific method** for fixing belief is proposed by Peirce as the only one to contain the required rigorousness to allow gradual, but actual convergence on some ultimate truth, in contrast to the above methods, which can be seen as potentially erroneous.

1.1.2. The Scientific Method

The following section details Peirce's description of the scientific method of enquiry.

Real life experience is the starting point for all enquiry. If experience fits the observer's expectations, all is well. If not, a process will be initiated to re-attain belief. The scientific method is proposed as the quickest and most sure way to progress from surprise towards belief. Figure 6 expands the specifics of the enquiry process that Peirce describes, but for a full understanding each stage requires detailed explanation. The following paragraphs will expand Peirce's description of the scientific method.

The process always starts from an experience of the real world. When an experience leads to surprise, the observer's belief is disturbed and a process to re-fix the belief initiated. '*Experience is the necessary beginning for all our knowledge, since there is no human knowledge that is not based on observed facts.*' [8] '*All knowledge whatever comes from observation*' [9]

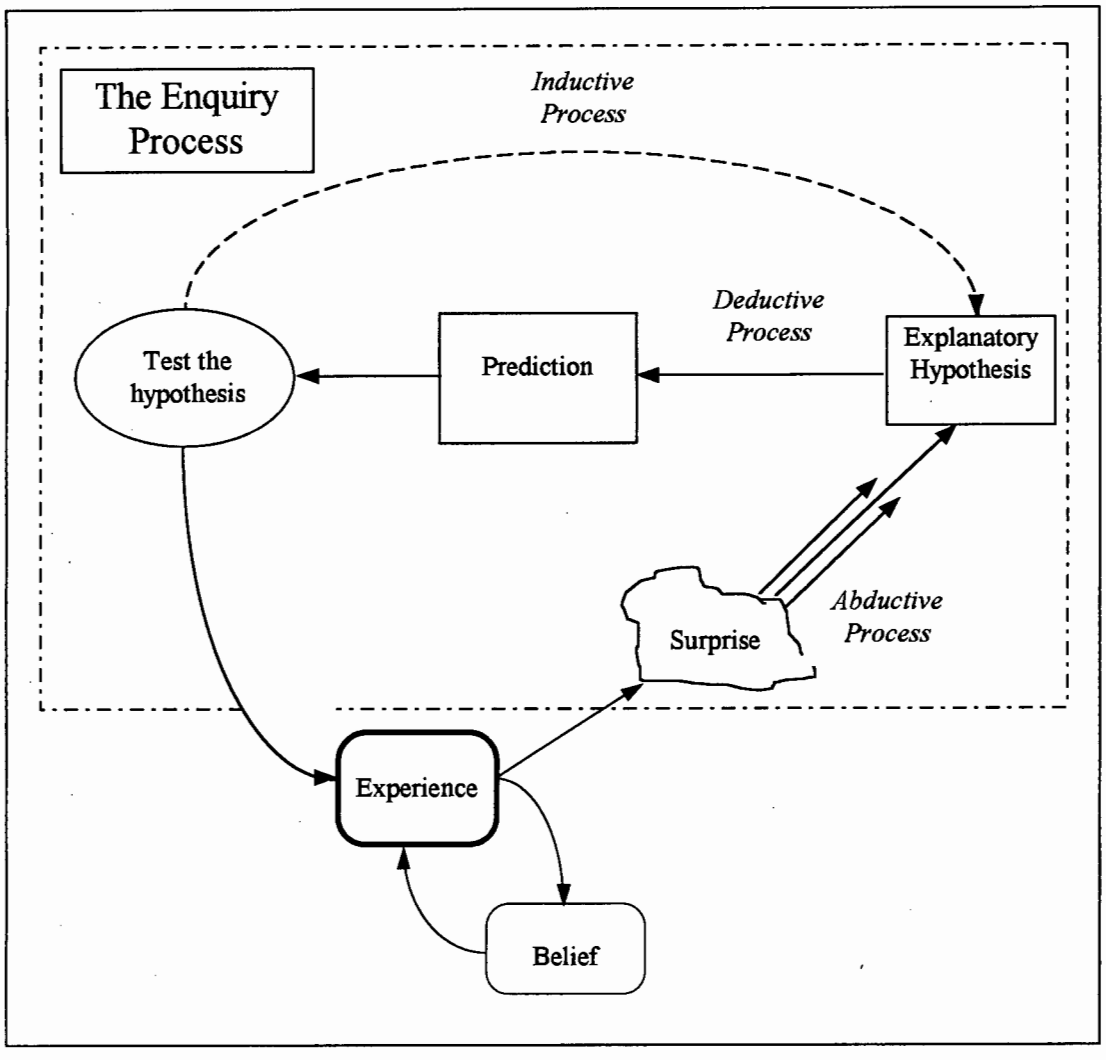

Figure 6 - The Scientific Method in Detail

Experience, then, is the starting point in the process of enquiry. An unexpected experience casts doubt in the mind of the observer and initiates a process of enquiry to satisfy the doubt. Once belief has been reached, by confirming an expected experience (resulting from one or more cycles of enquiry) the enquiry process rests.

Key to the internalisation of any experience is the perspective of the observer. Each individual will gain different insights from the same event or experience, depending upon, amongst other things, culture, previous experience, values, beliefs, etc.. *'Progress in science depends upon the observation of the right facts by minds furnished with appropriate ideas'* [10] *'The inquirer begins his scientific*

work with a background of experience. The longer he has lived the life of a scientist, the more experience he has accumulated; the expectations that he brings to his projects are more refined, more accurate than when he first began to do scientific work.' [11]

Thus, given an experience and a worldview, either the observer will be compelled to enquire further into the experience that was surprising, or, they will accept it as expected. *'Certain experiences build up habits of expectation in the observer, and when this habit is broken in upon by some unexpected event, the mind changes from belief to doubt, and should undertake a process of inquiry to explain the unexpected fact'* [12]

The surprise leads the observer to construct a new theory that might explain the unexpected result. Peirce terms this activity abduction: *'Abduction suggests a hypothesis, perhaps in the form of a question, which would serve as an explanation of the observed facts.'* [13]

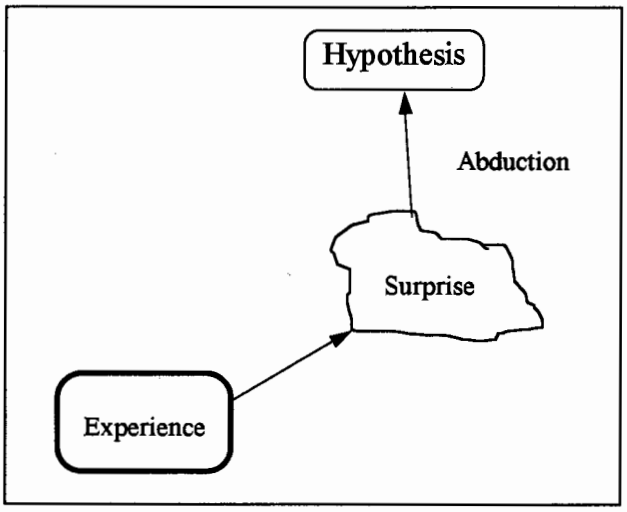

Figure 7 - Abduction

'Science begins with wonder, with a doubt of some sort, and with a pondering of these phenomena in all their aspects in the search for some point of view whence the wonder shall be solved.' [14]

Before testing whether the hypothesis suggested by abduction is true, the inquirer must '... *determine what he is testing for before he begins to test*' [15]. This phase is known as deduction. '*Deduction, then, is an unfolding of experiential consequences from the explanatory hypothesis.*'[16] '*The deductive process in a scientific enquiry must terminate with genuine predictions of the "if-would" variety.*'[17]

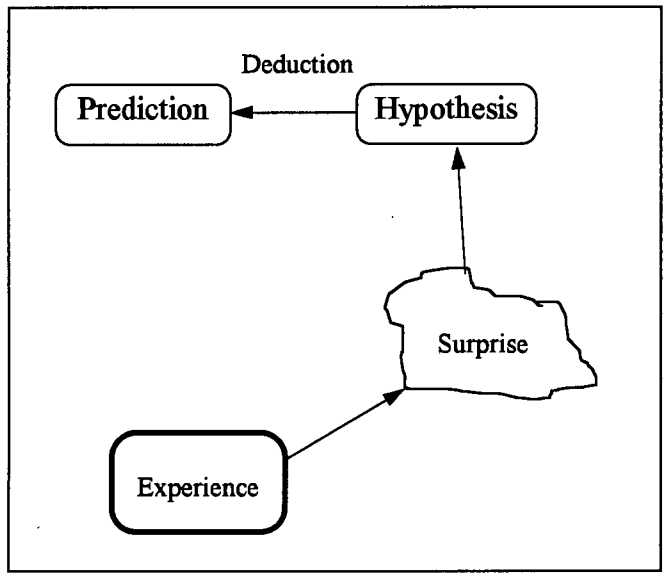

Figure 8 - Deduction

Having made predictions of the expected results of the tests, the real testing can be carried out. After the testing the investigator must check the results of the experiment with the original hypothesis to confirm or deny its validity: '*The deductive phase, therefore, of a scientist's investigation terminates with observable predictions which have been drawn from the explanatory hypothesis. The scientist must now see whether or not the predictions come true. This is the inductive phase of the inquiry.*' '*..induction is the process which verifies hypotheses by testing the consequences deduced from them.*'[18] '*Induction is both a generalising movement and an evaluative judgement*'[19]. Not only does the testing the hypothesis provide a basis upon which the inductive checking of the hypothesis can be carried out, but it also adds to the experience of the inquirer.

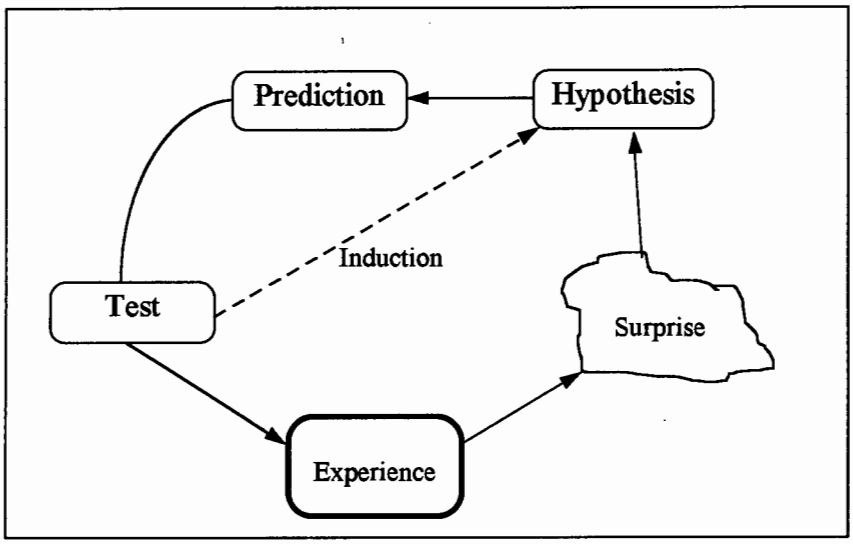

Figure 9 - Induction

Testing the hypothesis aids progress : ' *The new experiences of phenomena in the testing process function as the basis for a new, more accurate hypothesis. And the investigator becomes more qualified to select a better hypothesis, because of his more adequate background.*' [20] '*The careful method of evaluating the first hypothesis not only has increased his experience, but also sharpened his sense of values. His "feel" for the ways of nature has become more accurate.*' [21]

1.1.3. The Concept of a Community of Inquirers

The scientific method describes the steps that will be taken during any enquiry. An important question to address is how do individual inquiries integrate together to form a useable body of proven knowledge. For this Peirce introduces the idea of a community '*Thus the very origin of the conception of reality shows that this conception essentially involves the notion of a community, without definite limits, and capable of a definite increase in knowledge.*' [22] Truths will emerge from the consensus of the community of inquirers rather than from an individual.

Reilly expands Peirce's idea of the community : '*We cannot be quite sure that the community ever will settle down to an unalterable conclusion upon any given question. Nor can we hope for any overwhelming consensus. All that we are*

entitled to assume is in the form of a hope that such conclusions may be substantially reached concerning the particular questions with which our inquiries are busied.' [23]

As different inquirers pursue their interests over time natural selection of tested hypotheses will occur : '*And so those two series of cognition - the real and the unreal - consist of those which, at a time sufficiently future , the community will always continue to re-affirm; and of those which under the same conditions will ever after be denied.'* [24] Useful hypotheses will survive and continue to be used, others will be discarded.

Belief is useful in so far as it can be confidently used for purposeful action. '*Belief is both a stopping place and a new starting place for thought.*' [25] As long as the belief generates useful predictions which can bring about action, it remains a belief. However '*science progresses mainly by leaps, by a new method of observing, or a new way of regarding what we have observed.*' [26] These leaps may cast doubt on old beliefs and begin a new cycle of enquiry.

1.1.4. A Simplified Enquiry Cycle

In this section the Peircean model will be compared with a model of learning developed by Charles Handy and it will be shown that they describe the same thing. Handy's model will then be used in the rest of this thesis to represent the Peircean model as it is simpler. Figure 10 summarises the process of enquiry that has been described in Section 1.1.2. .

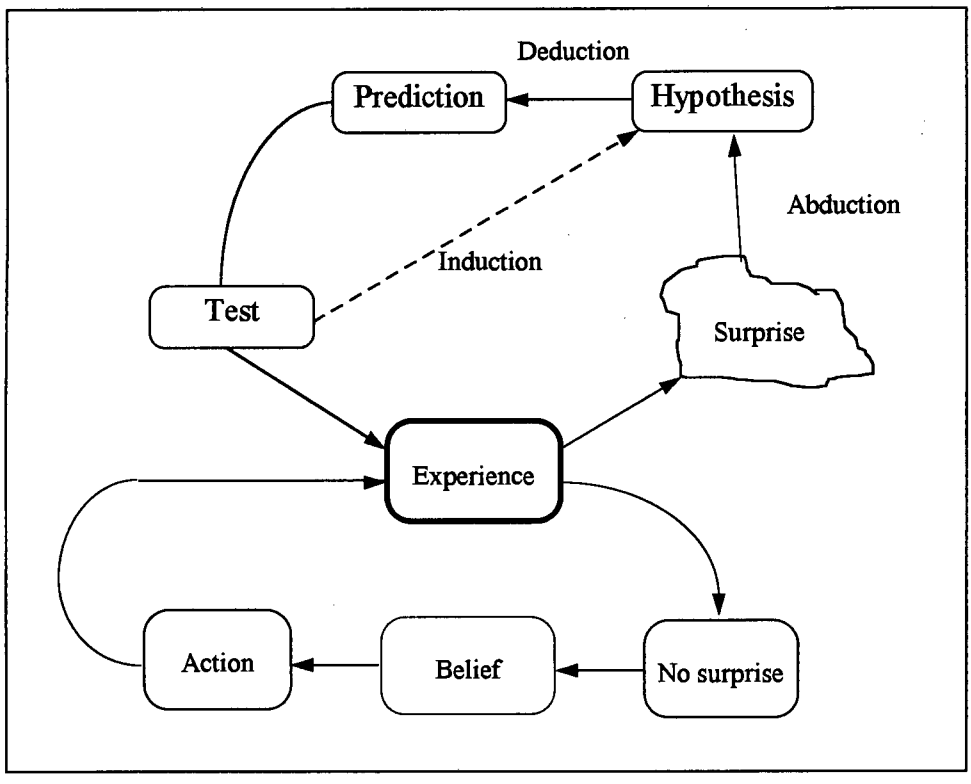

Figure 10 - A Summary of the Scientific Method

Charles Handy has proposed an alternative model of enquiry called the 'learning wheel'[27] which is illustrated in Figure 11. The detail of Handy's model is not described in this dissertation, as it is proposed that his model be used as an outline of the method of enquiry which Peirce proposes.

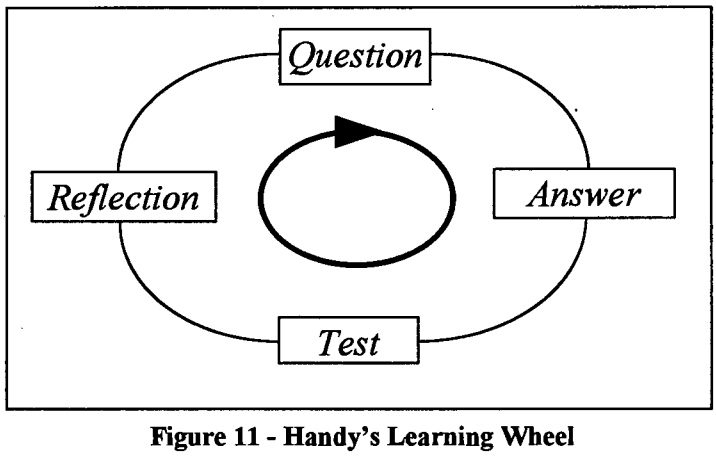

Figure 11 - Handy's Learning Wheel

Figure 12 shows how the learning wheel can be used as a summary of Peirce's more complex description of enquiry.

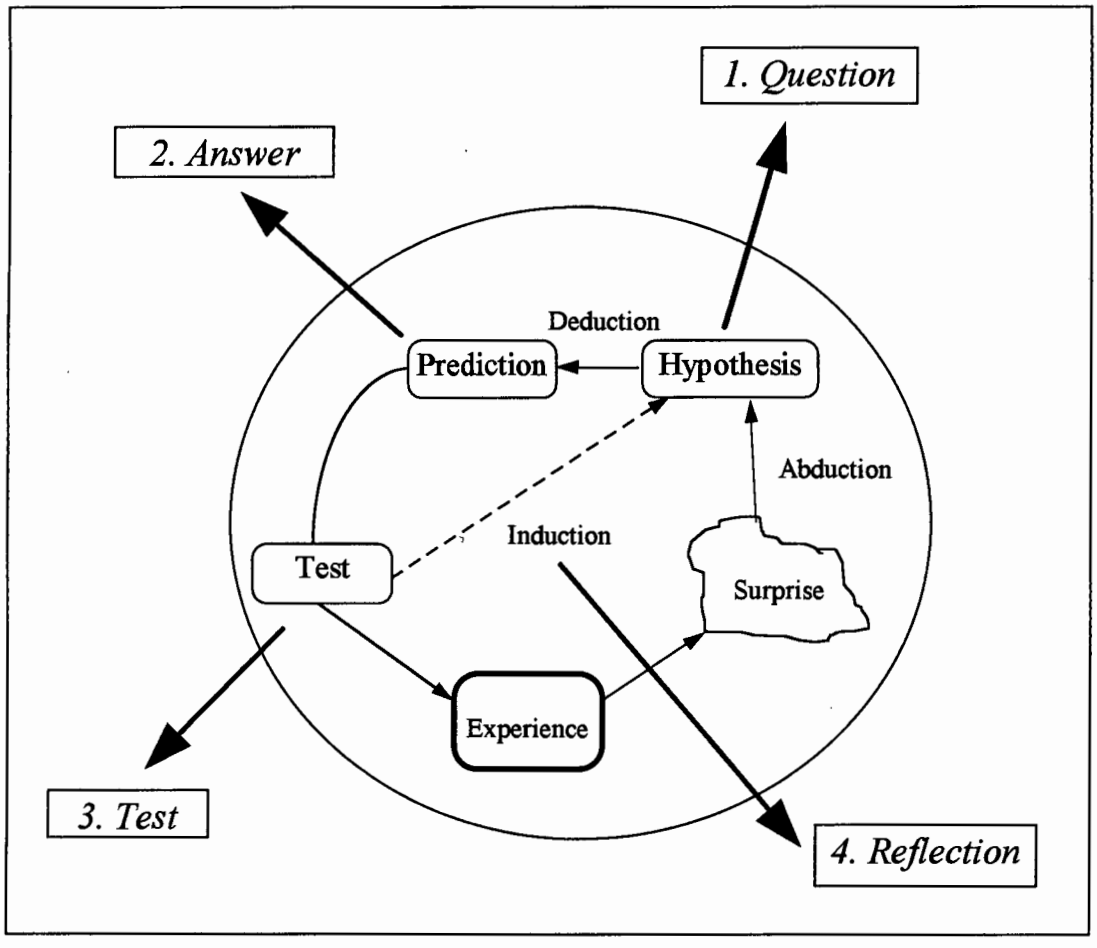

Figure 12 - Comparing Handy's Learning Wheel and Peirce's Scientific Method

Handy's question-answer-test-reflection framework will be used in place of the Peircean model for the rest of this dissertation. It will be assumed that the Peircean description is inherent in Handy's model.

1.2. The Development of Thought

This section describes the origin and development of systems thinking. It should be seen as background information for the descriptions of the two systems based methodologies, soft systems methodology (SSM) and systems dynamics modelling (SDM), which are to be used in this dissertation and are described in Sections 1.3, 1.4 and 1.5.

Checkland [28] suggests that the development of scientific thinking has reached a cross-roads : 'the machine age' view of the world is set to be replaced by a 'systems view', more able to deal with the increasing complexity of everyday life. To justify systems thinking, it is necessary, first to consider the type of thinking that it is to succeed and demonstrate the weaknesses in the machine age view. The following sections (1.2.x) are taken from Checkland's book Systems Thinking, Systems Practice.[29]

1.2.1. Machine Age Thinking : Analysis

The basic method of enquiry used in the machine age (a period which started breaking down circa 1940) was analysis. Analysis consists of three steps[e]:

(i) Break the problem into its constituent parts,

(ii) Try to understand the parts, taken separately,

(iii) Aggregate the understanding of the parts into an understanding of the whole.

This method of enquiry is constructed on two central assumptions : the first is that analysis, taken to an extreme, asserts that all things can be reduced to basic indivisible elements. This approach has led to the doctrine of reductionism. The third step of analytical enquiry, the aggregation of the

[e] The definition of analysis is taken from a video by Russell Ackoff 'Interactive Planning' prepared for the School of Engineering Management.

understanding of the parts into an understanding of the whole, rests on an underlying assumption of cause and effect. Every effect is the result of a cause. To identify the cause, it must be both necessary and sufficient for the effect. This deterministic approach leaves no room for chance occurrences : chance to the machine age thinker is merely a word for ignorance. Thus machine age thinking is environment free.

In recent years, however, this approach has received criticism, which can be broadly subdivided into two areas :

(i) The increasing complexity of modern life means that traditional approaches to enquiry break down, particularly when dealing with complex systems that have emergent properties.

(ii) Problem solving in social systems is unlike other situations, in that the system can react to a prediction made about it and thus thwart what appeared to be a provable hypothesis.

These two problems will be considered in turn :

1.2.1.1.Complexity and Emergence.

As far back as Plato (born 428BC) attempts have been made to categorise things by function. This tradition has continued and, as thinking has developed, it has been convenient to group learning into different categories or common areas : physics, chemistry and mathematics as examples.

As time has passed, areas in between subjects have arisen, biology as an example of a combination between physics and chemistry. Biology, however, cannot be described simply as an amalgamation of physics and chemistry; it should be seen as a recursive level higher in complexity. The key difference is that, whilst combining physics and chemistry into the biology of living things other characteristics emerge, such as the development of an embryo, which cannot satisfactorily be explained only in terms of the two base sciences.

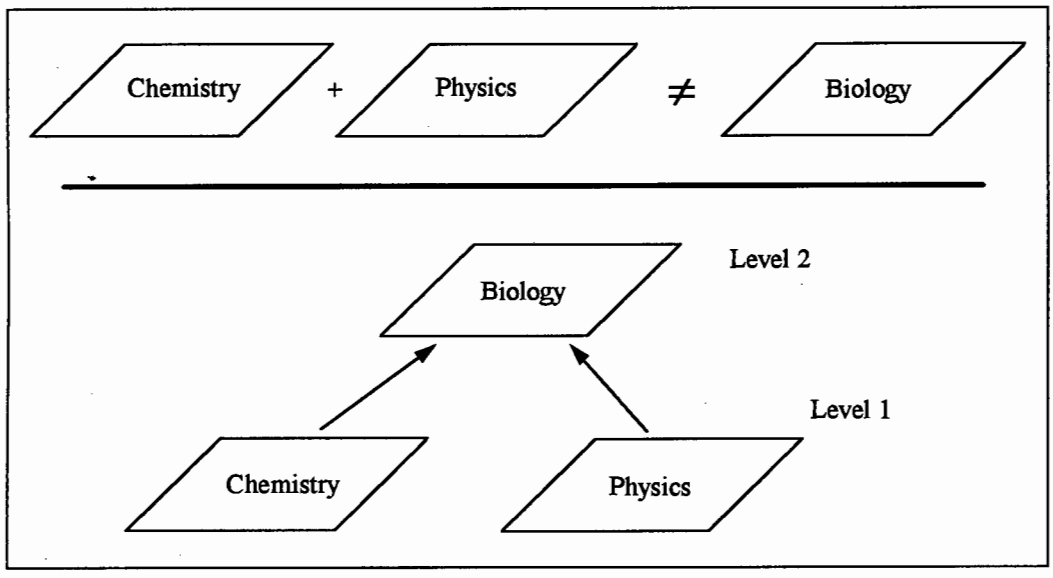

Figure 13 - Functional Categorisation and Emergence

The characteristic of emergence found in systems provides a serious challenge to deterministic thinking. By breaking a system apart in order to learn about it, as in analysis, the emergent properties will be lost. Similarly, if a part is taken out of a system, that part will lose the essential characteristics that it displayed through the interactions with other parts of the system.

To illustrate the concept of emergence[f], consider the system that enables one to see. The eyes, the nervous system and the brain would be considered key sub-systems along with the lungs, heart and arteries to supply the oxygen to keep the components alive. To analyse this system, one would break the components apart. Clearly the eye removed from the head cannot see. Indeed the very act of removing it from the system of which it is a part, means that the emergent property of sight is lost completely.

1.2.1.2.Social Systems

When dealing with mechanical systems, one could hypothesise on the working of the mechanism and test the hypothesis against practical results gained from using or testing the mechanism. More complex social systems

[f] This example has been taken from the video "Interactive Planning" produced for the University of Cape Town by Dr Russell Ackoff.

create problems for prediction of behaviour, as they are able to react to a prediction made about them. An example illustrates this dilemma : Suppose a machine was invented that could predict the behaviour of a person and the predictions tested against the person's actual behaviour and were each time found to be true. Now suppose the person was told of the predicted behaviour. As soon as the prediction was shared with the person, the prediction would no longer be valid, as the prediction was made based upon an incomplete knowledge of the person's state of mind. The significance is that we cannot predict the behaviour of social systems as the publishing of the prediction makes it invalid. Thus, we cannot arrive at laws of behaviour for social systems, but merely speculate on trends that may occur.

1.2.2. The Emerging Systems Age

During the Renaissance period thought advanced from unscientific mythology and magic, to a machine age view of the world. The present problems with the mechanistic view are initiating a transition from a machine to a systems age and fundamentally changing mankind's conceptions of how to understand and progress in science. It has been shown that analysis (see Section 1.2.1), though successful in the scientific revolution, cannot deal with the more complex systems that we seek to understand today. A new approach is needed to allow science to progress - this approach is systems thinking.

1.2.3. Systems and Systems Thinking

We have now reached a stage where another *Weltanschauung*[g] is in progress. Complex systems cannot be dealt with effectively using the traditional reductionist methodology. Thus the systems movement has proposed a new type of thought : 'synthesis'[h].

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[g] Change in the prevailing worldview

[h] The definition and explanation of synthesis is taken from the video "Interactive Planning" produced for the University of Cape Town by Dr Russell Ackoff.

Synthesis is the exact opposite of analysis and consists of three stages :

(i) Take the system to be considered and identify the supra-system of which it forms a part.

(ii) Identify the purpose and function of the supra-system.

(iii) Explain the system in terms of it's role or function within the wider system.

The synthetic step of making the system a part of a larger system in order to explain its behaviour overcomes the difficulties of losing emergent behaviour and ensures that an understanding of the interactions of the parts of the system will be obtained.

Analysis yields information and knowledge about the system being considered. Synthesis yields understanding. Systems thinking proposes that both synthesis and analysis must be used in thought and problem solving. We need to both know and understand the systems that are of importance.

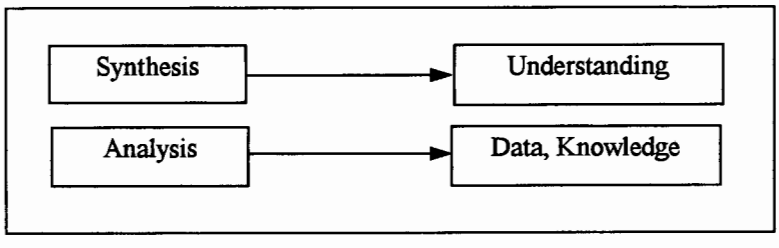


Figure 14 - Analysis and Synthesis

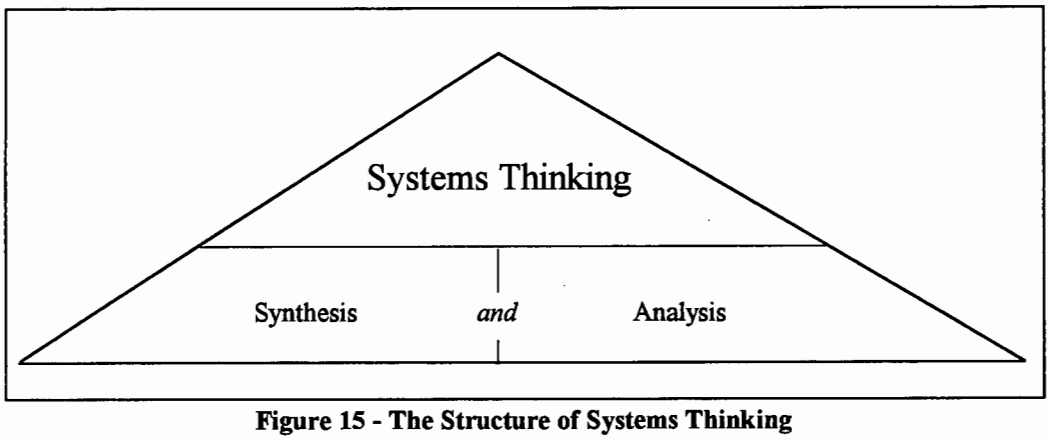


Figure 15 - The Structure of Systems Thinking

1.3. Dealing with Soft Issues

Having introduced systems thinking, the next three sections describe two systems based methodologies, SSM and SDM.

The author made a deliberate decision to choose the 'softest' approach available in selecting the methodology for his half dissertation. He felt that dealing with softer issues was a specific weakness having been educated in engineering at undergraduate and postgraduate levels. Soft systems methodology (SSM) proved the appropriate choice.

Much has been written on soft systems methodology (SSM) and the following sections synthesise a number of authors to describe the process that should be carried out to reflect the descriptions of SSM found in the literature[30 31 32 33].

1.3.1. An Introduction to Soft Systems Methodology (SSM)

SSM was created by Peter Checkland and co-workers and developed by many others, in response to situations where traditional systems engineering has been shown to break down. '*Engineering thinking is teleological, it asks what is the purpose of this system ? The engineer, thus, takes this purpose or objective as given and then works back from this to create a system to achieve the objective.*' [34] In essence, this approach can be described as '*the selection of an appropriate means to achieve an end, which is defined at the start and thereafter taken as given.*' [35]

In many situations the objectives are not clear and form part of the problem itself. Traditional systems engineering has no methodology to fix objectives and, thus, is inappropriate for '*messy situations*'[36]. Socio-technical systems, a combination of people and technology, create a variety of unstructured problems; SSM assists the enquiry process into problems of this nature.

The approach of SSM is to learn about the '*problem situation*'[37] in a structured way. The problem situation is an important concept. SSM maintains that two individuals viewing the same problem will interpret it in different ways. Emphasis is placed, therefore, on the need to sweep in different worldviews of the situation, to provide enlightening perspectives with which to re-examine the real world. Participation is thus an essential feature of the methodology.

Two streams of enquiry are initiated, the first based on logic and the second on culture. The two are brought together to assess which of the large number of systemically desirable changes are also culturally feasible in the given situation. Actions that are both culturally feasible and systemically desirable will still be difficult to formulate and it is usual for one attribute to be traded off against the other. The SSM process is summarised in Figure 16.

Whilst the 'two streams of enquiry' model is a useful metaphor for the process that SSM follows, the methodology encompasses seven distinct stages, which although represented sequentially (see Figure 17) does not imply rigid adherence to this sequence is necessary.

The seven stages of SSM are described in detail in the following sections.

1.3.2. Stages 1 & 2 : Finding out

Stages 1 and 2 attempt to build up a picture of the situation in which there is perceived to be a problem, not of the problem itself. Adopting a single view of the problem will stifle the debate on possible interventions.

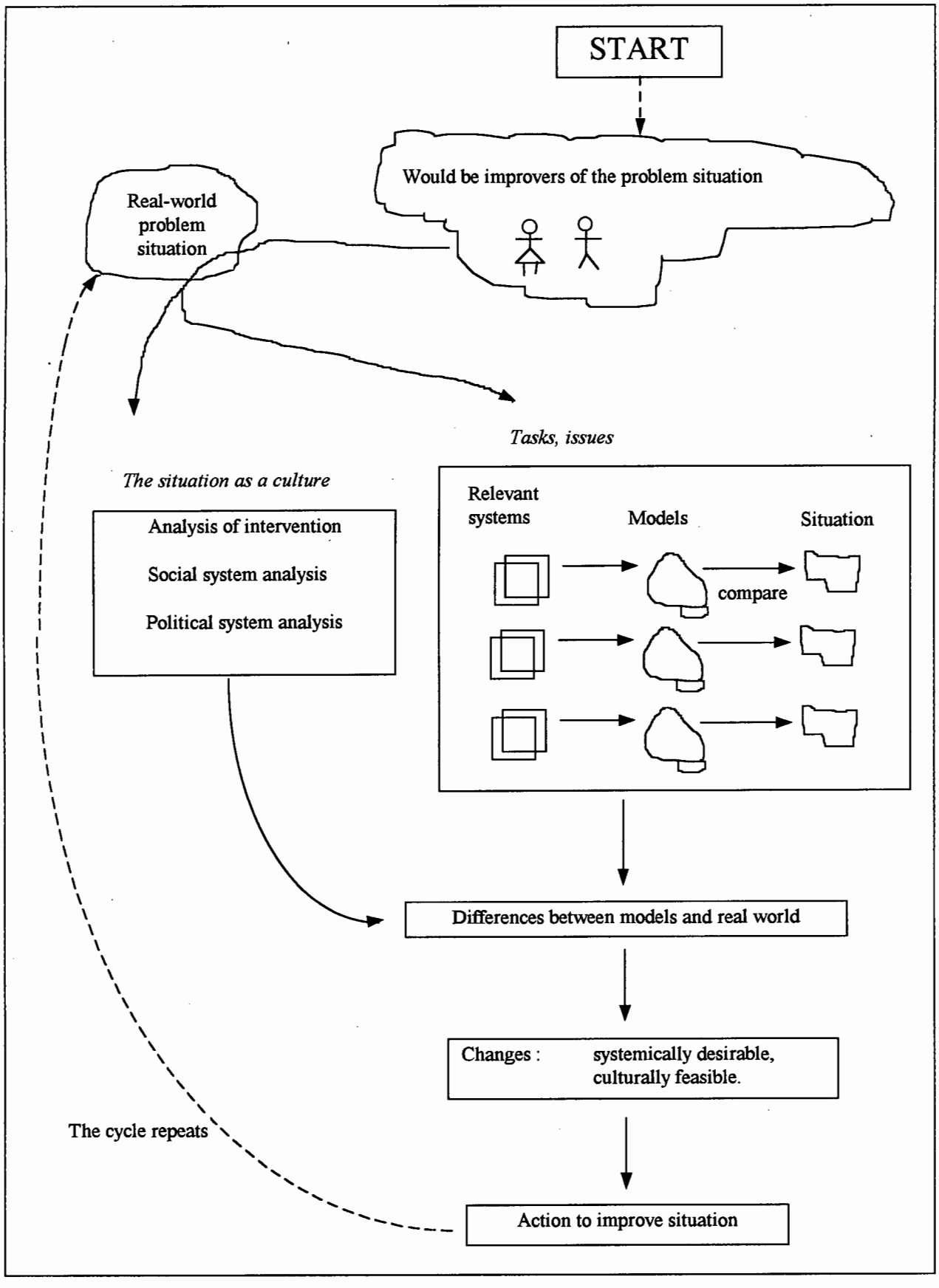


Figure 16 - Soft Systems Methodology as Streams of Enquiry

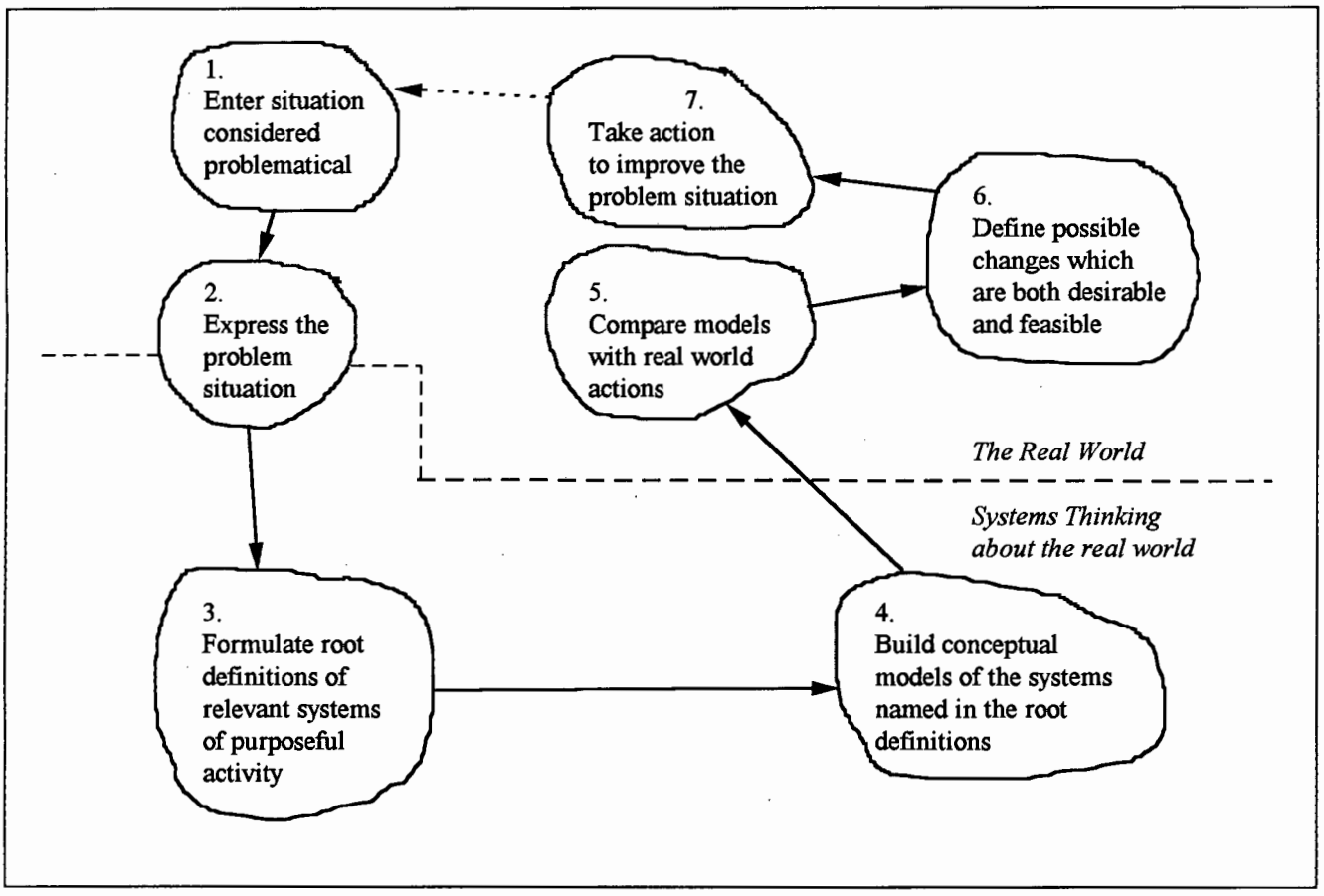


Figure 17 - SSM as a Sequential Process[i]

1.3.2.1.How should Immersion[j] *be structured ?*

The immersion phase is critical to the success of SSM (Stage 1 & 2 of the formal cycle). This stage concentrates on finding out about the problem situation, rather than addressing a particular problem or area of concern that has been identified.

A series of interviews, with the people who initially appear to be stakeholders in the perceived problem, is suggested as a starting point.

[i] The figure has been modified from Checkland's original to show systems thinking coming in the latter part of Stage 2 to Stage 4, rather than only in Stages 3 and 4. This modification was suggested by Johan Strümpfer in discussions about the project.

[j] The word 'immersion' was coined by Johan Strümpfer to describe the finding out and structuring activities of Stages 1 and 2 of SSM.

Each individual or group will contribute a different perspective on the problem, some more enlightening than others.

The problem of the interviewing process is getting the interviewee's perspective of the problem situation, without influencing him/her through the questions asked. In order to build up an unbiased understanding of the problem situation, Strümpfer has proposed a series of appropriate questions[38]. These can be summarised as:

(i) Future directed questions,

(ii) Present directed questions and

(iii) Problem situation directed questions.

Morgan[39] describes four dimensions of socio-technical systems shown in Figure 18. An awareness of the four different categories will improve the inquirer's ability to differentiate between issues in a complex situation.

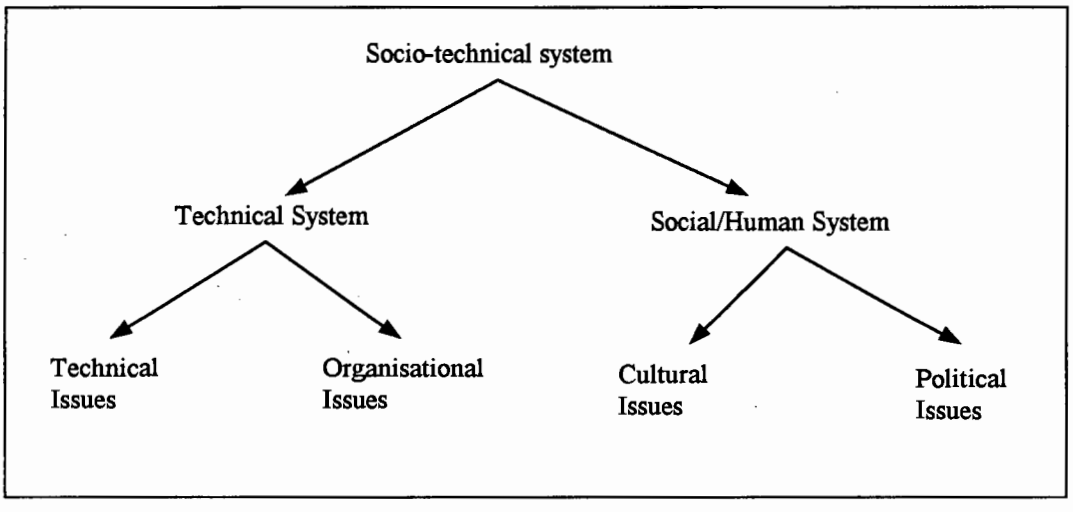


Figure 18 - Four Dimensions of Socio-Technical Systems

SSM stresses that a problem situation cannot be investigated in a neutral manner and will be affected by the personality, experience, knowledge and interests of the investigator; the effects of these factors have to be considered.

Having entered the problem situation in Stage 1, Stage 2 begins the process of expressing the situation. There are three specific analyses, each attempting to view the problem situation from a different perspective :

1.3.2.2.Analysis 1 : Roles

The first analysis takes the intervention in the situation as the subject matter and then identifies the 'clients' - those who cause the intervention, the 'problem-solvers' who conduct the study and the 'problem owners' who are saddled with the problems. This provides the guide to those with interests in the problem and the roles they will play. Figure 19 summarises this analysis.

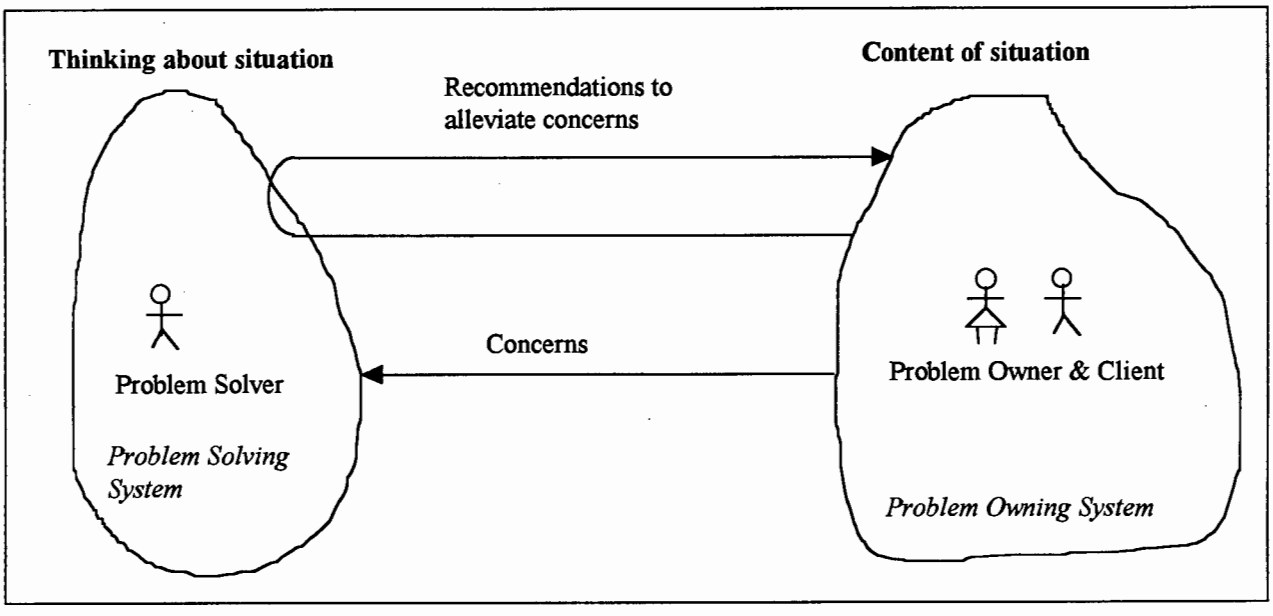


Figure 19 - Roles in a Problem Solving Process[k]

1.3.2.3.Analysis 2 : Culture

The second analysis establishes (a) which social roles are important in the situation (b) what norms of behaviour are expected from the role holders and (c) by what values performance in role is deemed to be good or bad. This

[k] The diagram has been modified from Checkland's original to show the 'Recommendations to alleviate concerns' originating in the 'Problem Owning System' rather than the 'problem solving system'.

investigation ensures attention to the culture of the situation. These three factors interact to form the culture of the situation. Figure 20 illustrates this interaction.

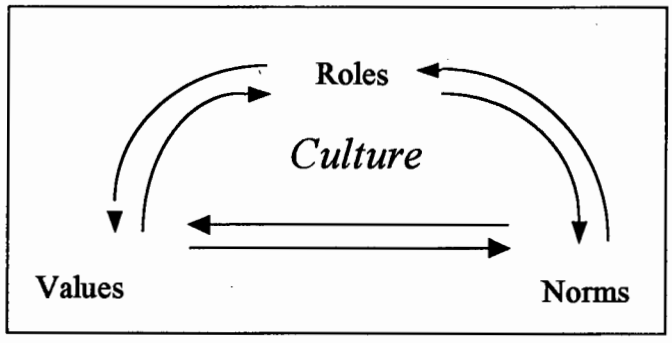


Figure 20 - The Interactions of Roles, Norms and Values

1.3.2.4.Analysis 3 : Politics

The final analysis examines the situation politically, by posing questions about the disposition of power ; through what commodities power is manifest? How are these commodities obtained, used, preserved and passed on? Each contributes to an understanding of the politics of the problem.

Together the three analyses yield a rich picture of the problem situation from which some systems of purposeful activity relevant to the exploration of the problem situation can be selected.

1.3.2.5.Other Possible Analyses

In addition to the three formal analyses, two other filters are suggested. The first examines the relationship between process and structure in the problem situation. The interaction between the process and structure in a situation form the climate. It may be useful to use this analysis if the climate of the problem situation seems problematic.

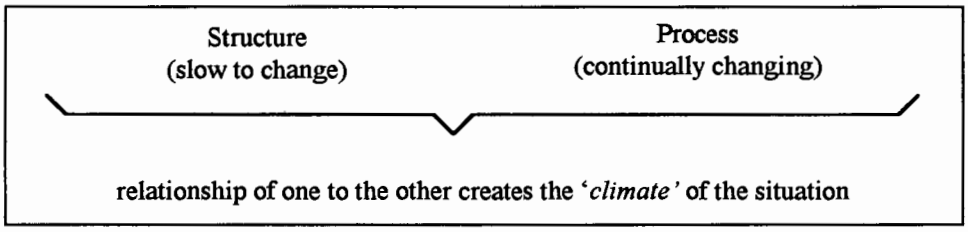


Figure 21 - Process, Structure and Climate

The second filter allows the use of any other systems based models in the expression stage e.g. the viable systems model[40] or human performance technology[41].

1.3.3. Stages 2, 3 & 4 : A Summary

The latter part of Stage 2, combined with Stages 3 & 4 represent a progression of increasing descriptive detail about systems considered to be relevant to the problem situation. The three stages, from 2 to 4, can be expressed as an 'expanding triangle'[1], shown in Figure 22.

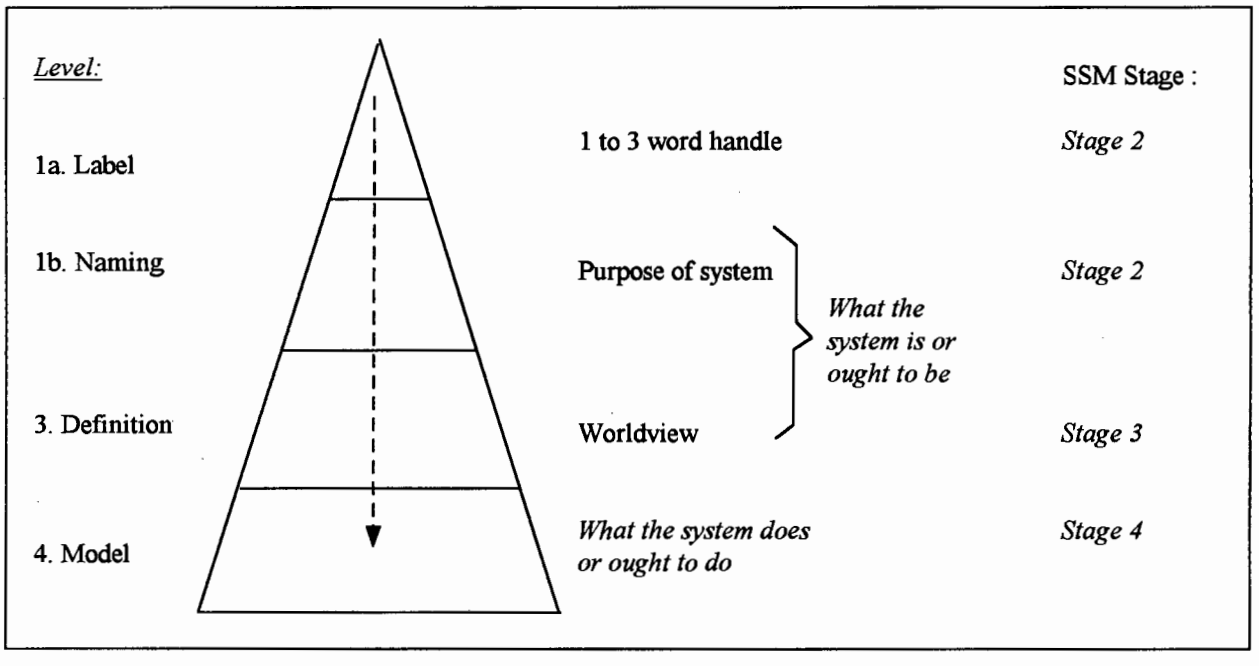


Figure 22 - Stages 2 to 4 : An Expanding Triangle

The progression of the systems thinking dimension of the investigation thus continues to an increasingly more detailed description.

1.3.3.1.Stage 3 : Formulating Root Definitions

Formal systems thinking is used in SSM when formulating the root definitions. Root definitions (RDs) are written for systems

[1] Proposed by Johan Strümpfer in discussions about SSM

carrying out purposeful activity thought to be relevant to deeper exploration of the problem situation and which will lead to action to improve it. RDs have the status of hypotheses concerning eventual improvement of the problem situation. Comparison of the model of the RD with the real situation will lead to illumination of the problem.

Initially RDs should contain a maximum of about six verbs i.e. be low resolution, such that each major activity can then be expanded; It is important however to maintain a constant recursive level and to remember that relevant RDs are not necessarily desirable ones. A mnemonic "CATWOE" is used for this purpose :

Table 2 - The CATWOE Analysis

C	Customer	Who would be victims/beneficiaries of the purposeful activity ?
A	Actors	Who would perform the activity ?
T	Transformation Process	What is the purposeful activity expressed as : Input → [T] → Output ?
W	Weltanschauung	What view of the world makes this definition meaningful ?
O	Owner	Who could stop this activity ?
E	Environmental constraints	What constraints in the environment does this system take as given ?

Using the mnemonic in a different sequence can help to improve the insight gained through the process. The sequence TCAOEW[m] can be of more use, concentrating on the transformation initially, fleshing out the definition and lastly defining the worldview that the definition represents. Two other categories can be added to the model[n]:

[m] Suggested by Johan Strümpfer in discussions about SSM
[n] Suggested by Johan Strümpfer in discussions about the project.

Table 3 - Additions to the Basic CATWOE

B	Beneficiary	Gets away from the loaded meaning of customer. Who benefits from the transformation?
H	Hurt	Who could be hurt if the proposed system is implemented?

1.3.3.2.Stage 4 : Building Conceptual Models

The model building process consists of assembling the verbs describing the activities that would have to be in the system named in the RD and structuring them according to logical dependencies. The RD is an account of what the system *is*, the model describes what it must *do* in order to be the system named in the RD. The model must be based purely on the RD and not distorted by what actually occurs. Figure 23 shows a generic model of a human activity system.

A useful aim is to construct a model with the 'magic number'[42] of 7 +/- 2 elements. The concept to be used when describing the system is that it should be able to adapt and survive in a changing environment. This leads to enquiry of the control and monitoring systems present in the system. In considering how the system may fail, there are three areas that should be examined :

Effectiveness : Is the system doing the right thing ?
Efficiency : Is the system doing things right ?
Efficacy : Is the system able to do things right ?

A general outline of the performance measurement of a human activity system model is illustrated in Figure 24. It is significant that the effectiveness of the system is decided by the wider system which contains it and important to work only from the root definitions in constructing the systems models.

1.3.4. Stage 5 : Comparing the Models and Reality

The models constructed in Stage 4 provide a discussion point from which to seek possible changes to the problem situation. Four methods have emerged for discussion concerning the models, the specific method dependent upon the issues considered to be important.

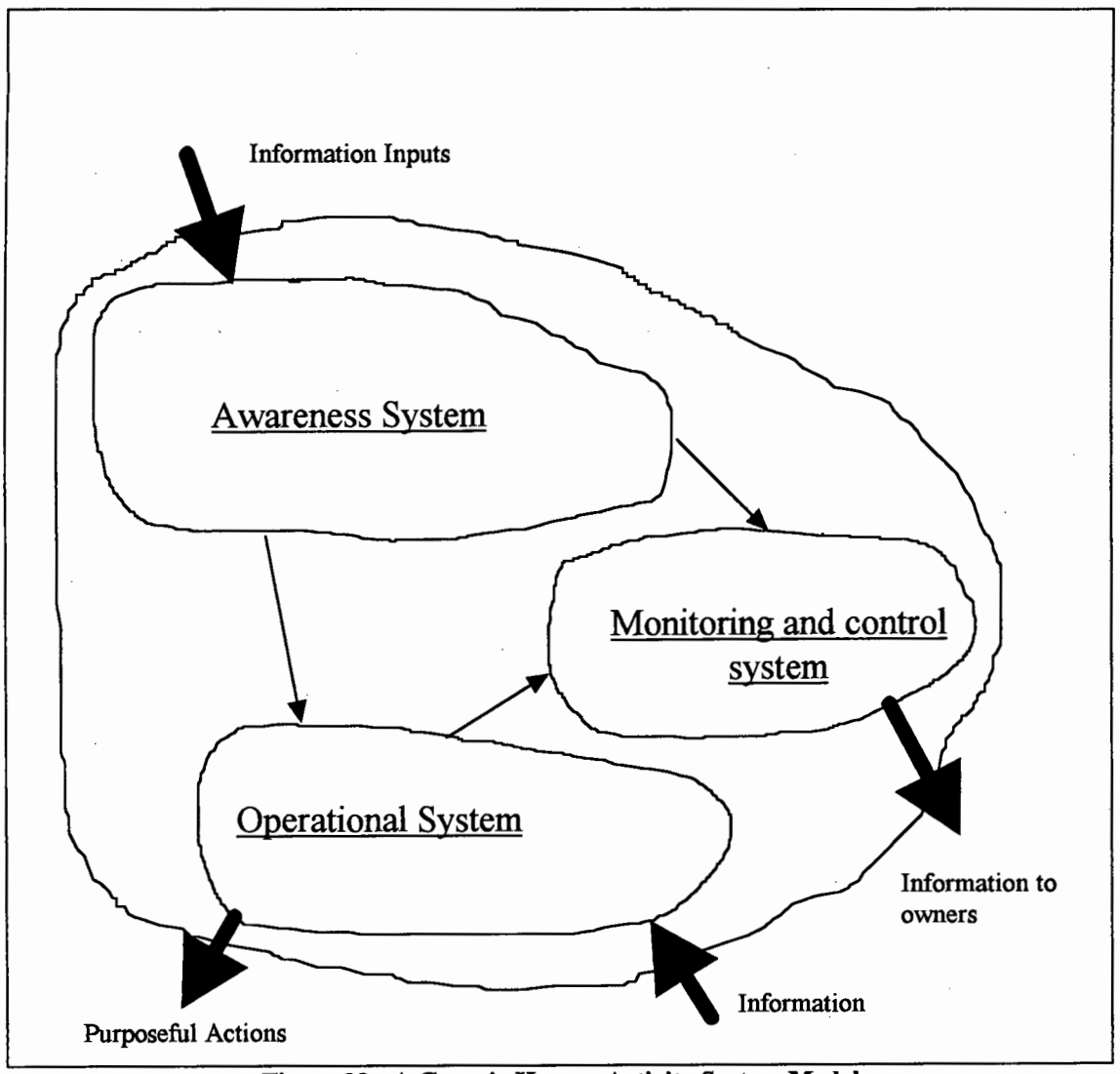


Figure 23 - A Generic Human Activity System Model

(a) The least formal method is merely to discuss the features that stand out between the models and current perceptions of reality; then to list the differences and decide which are important. This is an effective approach where roles or strategies are issues.

(b) For a more detailed concern, such as improving operations and information flows, each model is used to define a series of specific questions concerning activities and links between activities. The answers to the questions are then sought in the real situation. Questions such as the following may be asked for each link in the model:

Does this happen in the real situation ?

How ?

By what criteria is it judged ?

Is it a subject of concern in the situation ?

(c) Operating the model on paper and describing how things might happen can be used to prompt discussion of the merits of what actually does occur.

(d) Building a second model of the reality of the situation and comparing the two, leads to potential areas for improvement being identified.

1.3.5. Stage 6 : Defining Changes

The purpose of the comparison stage is to use the differences between the models and reality to initiate discussion and seek potential improvements. Suggestions need to be systemically viable and justified by logic to give the required improvement. The proposed change must also be culturally feasible and therefore acceptable to those who will be affected by the changes.

1.3.6. Stage 7 : Taking Action

Upon implementation of the identified changes, the problem situation itself will be changed and thus the cycle may be repeated as required. The issues that have been addressed may recede in importance but will be replaced by other

concerns. Whilst the problem situation will never become completely problem free, there will be a process of learning and improvement on each cycle.

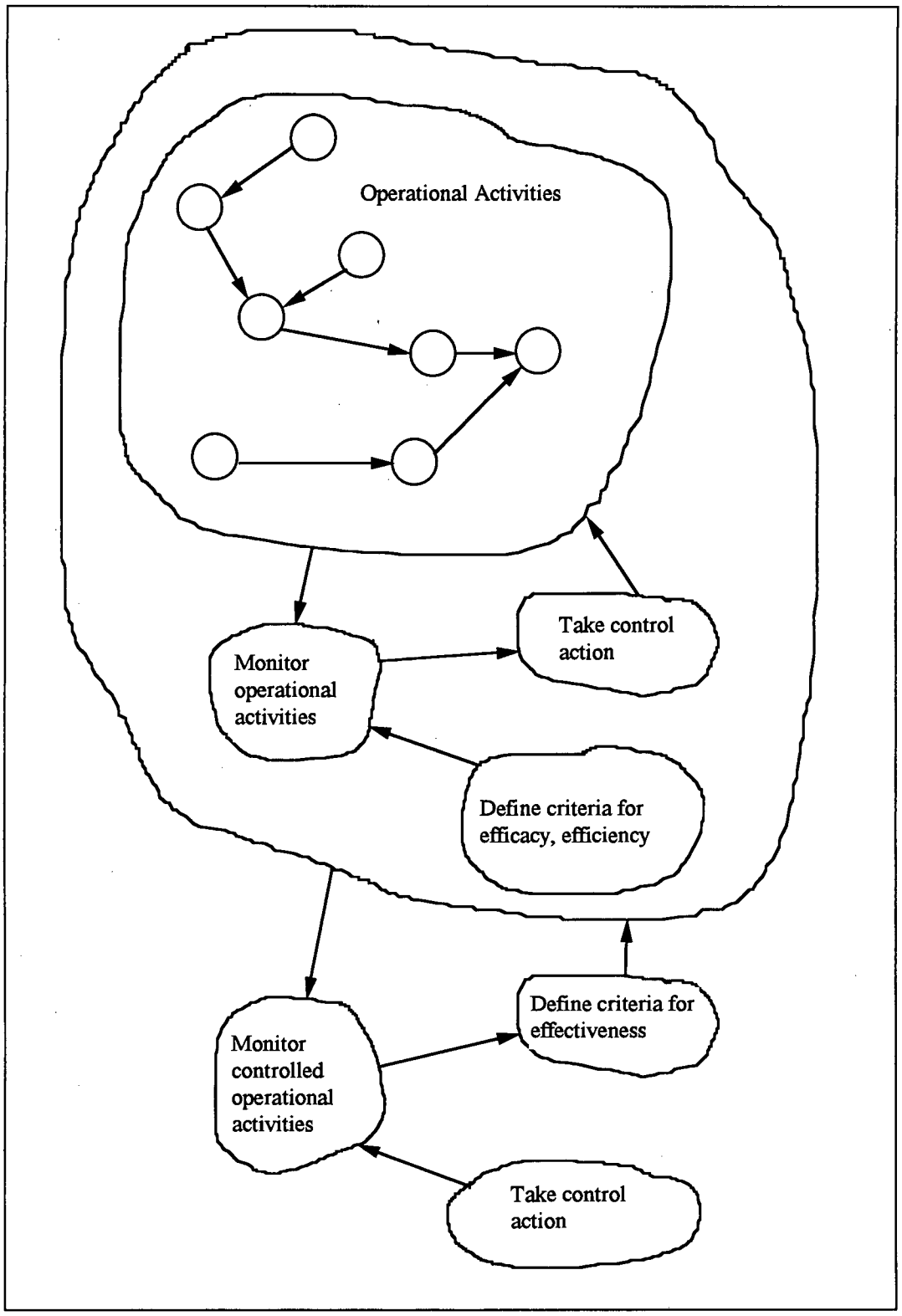


Figure 24 - Monitoring the Performance of a System

1.4. Learning as Enquiry

The detail of SSM has been described in Section 1.3, this section looks at SSM's use in the context of an enquiry process. This additional level of detail is warranted as SSM will be the primary methodology used in the project.

Flood and Jackson[43] cite SSM as being based upon four main principles: learning, participation, two modes of thought and culture. Davies identifies the first two principles in the following quote, which synthesises ideas from Checkland, Churchman and Vickers : " *The purpose of SSM is seen as that of orchestrating a debate such that learning may be enhanced: this is carried out so that the use of systems ideas may provide the structure for learning such that problem situations may be changed through a process of enlightenment.*" [44] From this quote the first two principles are evident : SSM initiates a debate centred around learning. In order for this debate to be meaningful a variety of differing views must be considered, making participation a key requirement.

In the sequential model of SSM (see Figure 17, page 21) Checkland makes a distinction between the real world and systems thinking about the real world. It is important to maintain this distinction clearly : "*...it is perfectly legitimate for an investigator to say 'I will treat education provision as if it were a system' but that is very different from declaring that it is a system.....Choosing to think about the world as if it were a system can be helpful. But this is a very different stance from arguing that the world is a system....*"[45]

The last principle, that of culture is perhaps the most difficult to grasp. Stage 6 of SSM defines changes that are both systemically desirable and culturally feasible. If the proposed interventions do not fit within the cultural framework of the wider community in which they are to be implemented, they will not achieve the desired results.

In moving away from the harder problem solving techniques, namely, of selecting a means to arrive at a pre-defined end, SSM describes a process of enquiry which philosophically must never end, but which pragmatically pauses after an appropriate action that alleviates the problematic symptoms.

Figure 25 illustrates that SSM describes a process of sampling reality, structuring interventions and intervening, only for the intervention to change the reality. The new reality will therefore need to be sampled again, the cycle repeating ad infinitum.

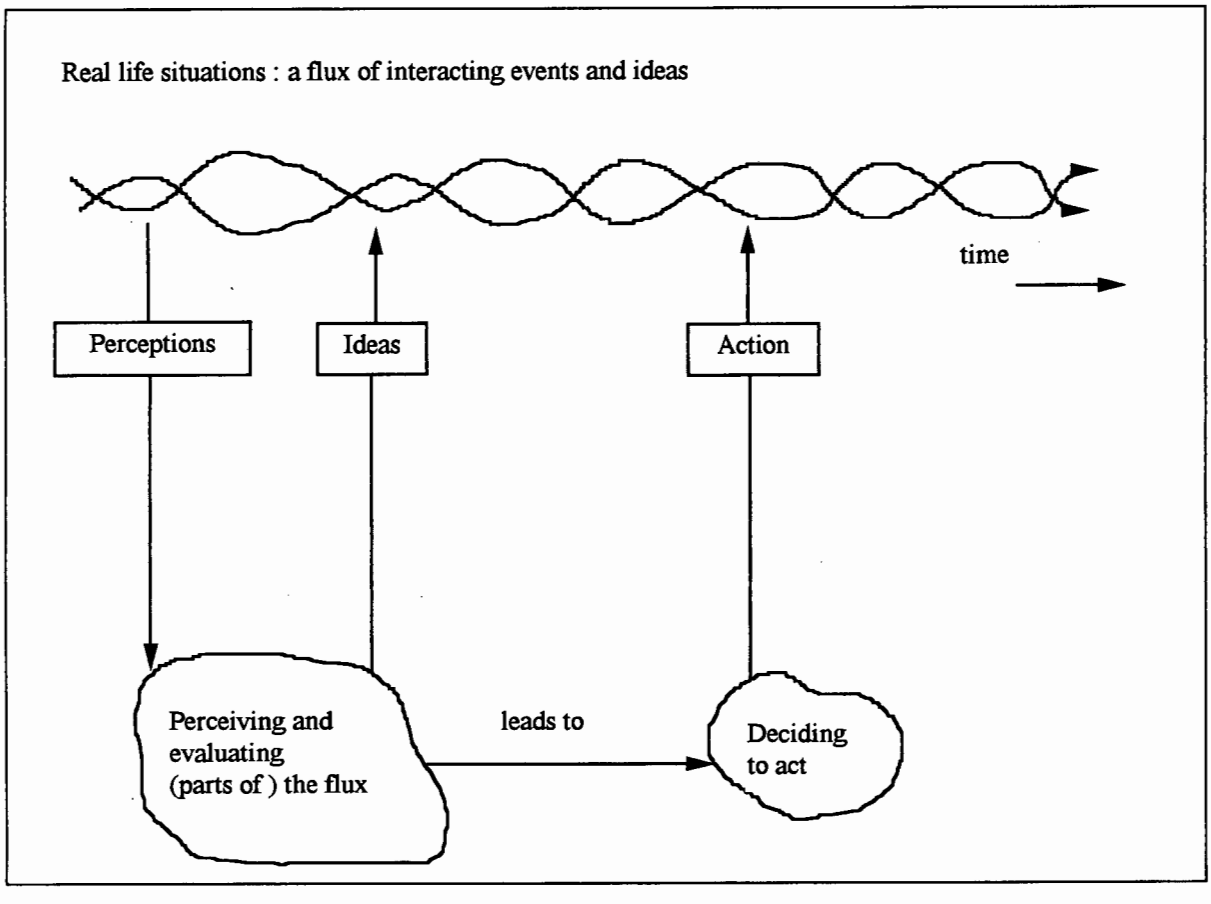


Figure 25 - The Interaction of SSM and Reality

1.4.1. Placing SSM in the Process of Enquiry

The preceding sections have constructed the framework for the project. A Peircean framework for learning has been constructed, the mind-set of systems thinking has been justified and SSM, a methodology for enquiring into soft

issues has been described. It is now necessary to demonstrate that SSM does not contradict the Peircean framework within which it could operate.

Whilst SSM, as a systems based methodology, forms the core of the project, this methodology requires placing within the broader philosophical framework of scientific enquiry (provided by Peirce in Section 1.1).

SSM may be used in either the abductive or inductive phases of this cycle.° SSM will be used in this project to formulate hypotheses about actions to be taken in the problem situation. Superimposing an abductive use of SSM onto the scientific method gives the following:

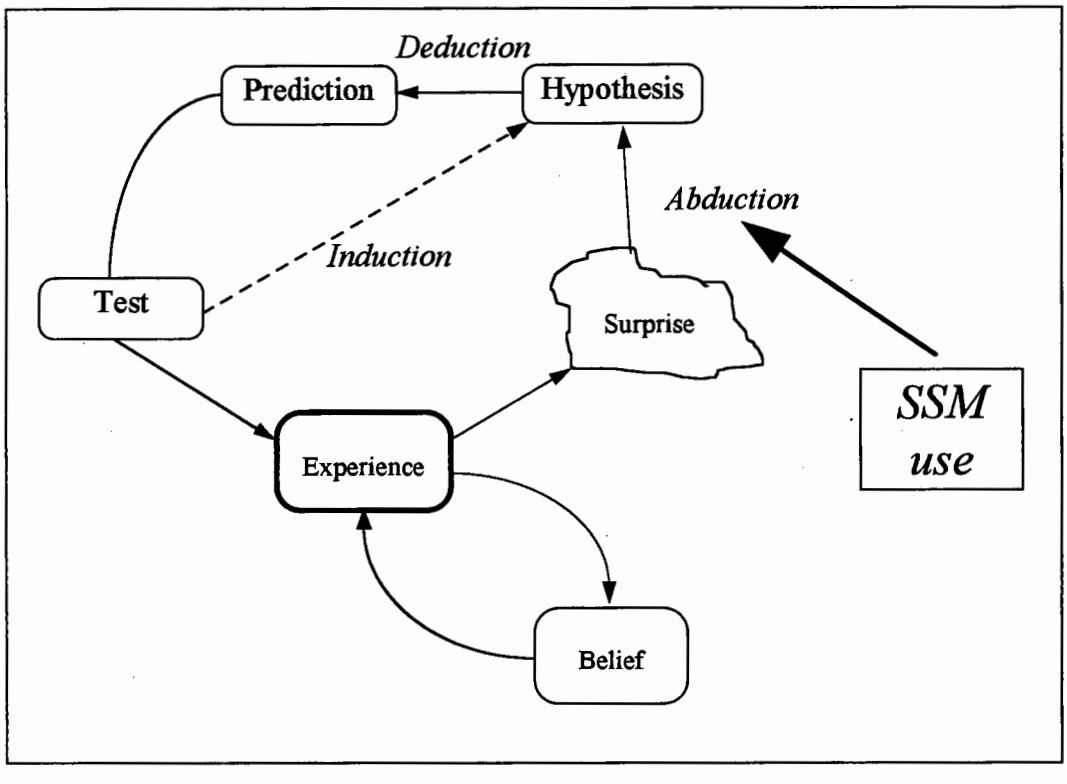


Figure 26 - The Scientific Method : Version 3

As the duration of the project is too short for total implementation, an additional methodology is required for the inductive phase of enquiry and systems dynamics modelling (SDM) will be used. SSM gives a stationary

° Suggested in discussions by Associate Professor Tom Ryan, School of Engineering Management, University of Cape Town.

picture of the interventions suitable for the problem situation; SDM will question the dynamics of the interventions over time and consider the interactions between the interventions in the problem situation.

1.4.2. The Underlying Enquiry System of SSM.

At the end of his first book on SSM[46], Checkland reflected on other research that could contribute to understanding SSM. *'I noticed that to a remarkable degree it [SSM] could be seen as an operational version of Churchman's theory of enquiring systems. Within the methodology, the debate about feasible and desirable changes in Stages 5 & 6 seeks Lockean consensus of concerned actors ...'* [47] Checkland goes on to compare stages of SSM to other inquirers described by Churchman. Whilst these comparisons may not be wholly appropriate, the concept of SSM as a Lockean inquirer is valid and worth describing in more detail.

Churchman describes the purpose of Lockean inquirers as *'to develop a learning process, in which they attempt to generalise their experience. Supposedly , they do this by means of induction from their agreements about specific observations.'* [48] This process of interpreting and generalising experience *' require[s] strong generalisations about space, time and agreement, but these are erroneously taken to be systematically independent of the process of observing.'* [49]

'In the case of human inquirers, the agreements that establish the objectivity of data are based on strong subjective opinions about the characteristics of the inputs' [50]

'..if an individual tries to compare two inputs with respect to a certain standard, he often finds it difficult to arrive at a judgement that all members of the community of inquiring systems would agree upon. Nevertheless, there can be substantial agreement within a certain range, and declining agreement as the comparison becomes more difficult. In addition to this situation, there are obviously a number of very important hypotheses governing human life in which the full generalisation of the form "All a is b" is not valid, but nevertheless one may arrive at

a fairly well-substantiated assertion of the form "In p percent of the cases, a's are also b's."' [51]

'What if two members of the community cannot agree....The only answer must be that all disagreements are to be resolved by the overwhelming agreement of the rest of the community' [52]

The description above is echoed in Peirce's description of the scientific method : '*Thus, the very origin of the conception of reality shows that this conception essentially involves the notion of a community, without definite limits, and capable of a definite increase in knowledge.*' [53]

Reilly expands Peirce's idea of the community : '*We cannot be quite sure that the community ever will settle down to an unalterable conclusion upon any given question. Nor can we hope for any overwhelming consensus. All that we are entitled to assume is in the form of a hope that such conclusions may be substantially reached concerning the particular questions with which our inquiries are busied.*' [54]

The concept of the Lockean Community being the entity which must, through a process of learning, reach, or come near to, consensus on an acceptable interpretation of the problem, is therefore a key concept in the use of SSM. Ideally the community would consist of all stakeholders and parties affected by the problem situation. Should learning not occur during the enquiry, the whole enquiry process must be deemed a failure.

In many real life situations it may not be possible to involve the whole Lockean Community due to practical resource and time constraints. Therefore the obvious solution would be to choose a group of individuals seen to be broadly representative of the wider community. As learning must be a key element of the enquiry process, the group may no longer be representative of the original population once the project is complete. The remainder of the population will need to be taken through a similar learning experience for Lockean consensus to be even achievable.

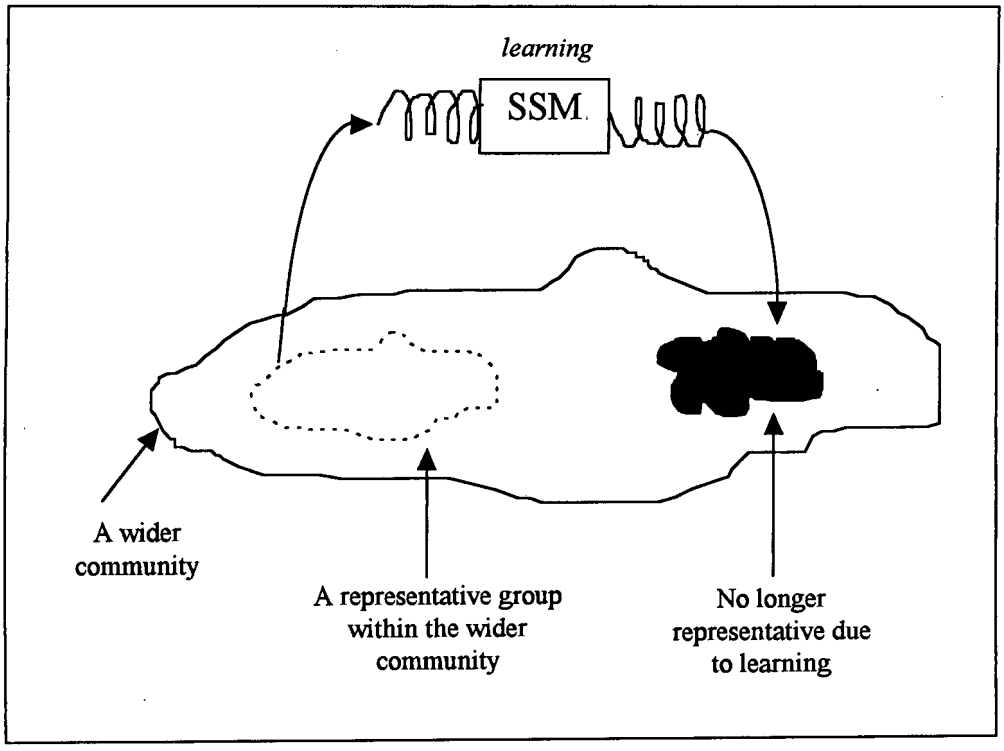


Figure 27 - The Problem of Representative Groups

1.5. An Introduction to Systems Dynamics Modelling (SDM)

Section 1.4.1 shows that SSM forms only part of the process of enquiry. SDM will be used to look at the proposed actions generated by the use of SSM from a different perspective and deduce the logical consequences of the proposed solutions.

In order to lay a conceptual framework for the project, it is therefore necessary to consider the theoretical background to SDM. The description of SDM below has been taken from two texts. [55, 56]

SDM was developed predominantly by Jay Forrester in the 1950s. He synthesised three fields : control engineering (feedback and system self regulation), cybernetics (information and its place in control systems) and organisation theory (the structure of human organisations and forms of decision making). Forrester developed a guiding philosophy and a set of representational techniques for simulating complex, non-linear, multi-loop feedback systems.

1.5.1. Some Underlying Assumptions of SDM

SDM assumes that a complex situation can be viewed from an objective, external perspective (which is notably in conflict with the approach of SSM that assumes each individual will view a situation from his/her own particular worldview). The behaviour of a system will be caused predominantly by the underlying structure of the system, rather than random events or external disturbances. The approach identifies all the elements that are likely to influence the system, given the purpose of the enquiry, and attempts to determine the interactions between the elements.

A weakness of the above focus on systemic structure is the assumption that most systems dynamics models have a fixed structure that will not

evolve. Thus, the behaviour of a specific state of a complex system can be explored but no evolution of the underlying structure of the system will be explicitly exposed.

1.5.2. Conceptualising Complex Systems

In attempting to conceptualise a system, SDM categorises the elements into levels and flows. Elements of the system interact through feedback loops to alter the flow rates, which after a time delay, will cause levels within the system to alter.

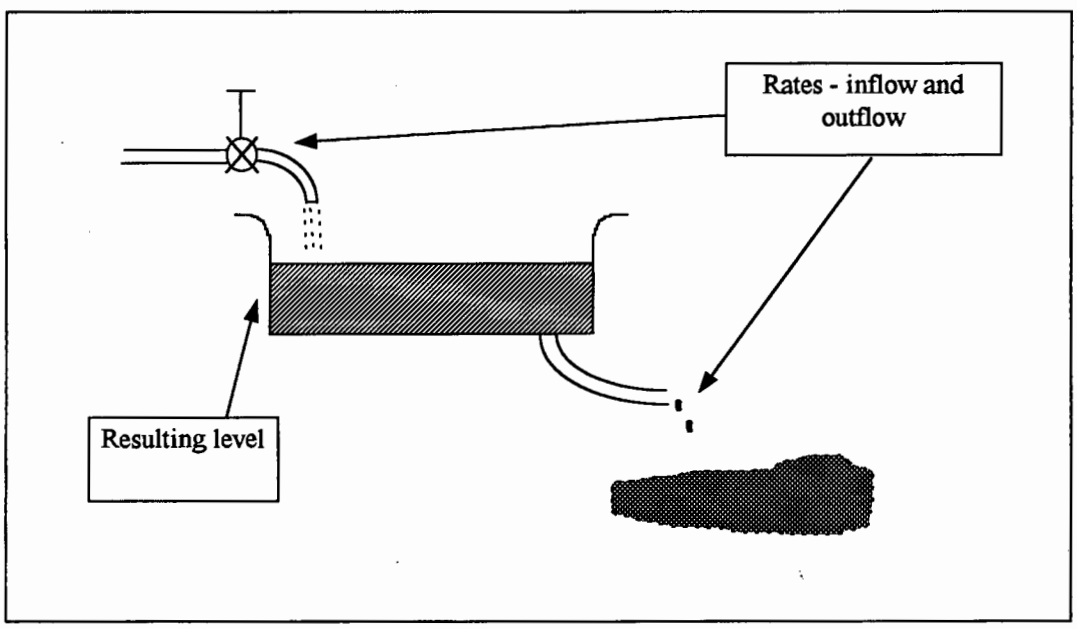


Figure 28 - Flows and Levels

1.5.3. Using the SDM Approach

Whilst SDM often results in a computer simulation, equally important learning is gained through construction of the model. The computer model is used to explore the possible dynamics of interacting variables over time.

Use of SDM within the project will be confined to exploring the dynamic interactions of the proposed interventions and constructing a set of influence diagrams to expose some underlying assumptions. The diagrams will be of use during the implementation phase to show the critical aspects of the interventions, which, if not managed correctly, may cause unexpected or undesired consequences.

1.6. Synthesis of a Framework for the Project

The first five sections of this chapter have described individual elements of the conceptual framework for the project which must be integrated. The enquiry process serves as a high level description of the required process that the project must follow. SSM and SDM must fit into specific phases of the enquiry. The systems paradigm provides a useful approach to conceptualising reality, on which both SSM and SDM are based. This, the final section in the first chapter will synthesise these elements into a theoretical framework for the project

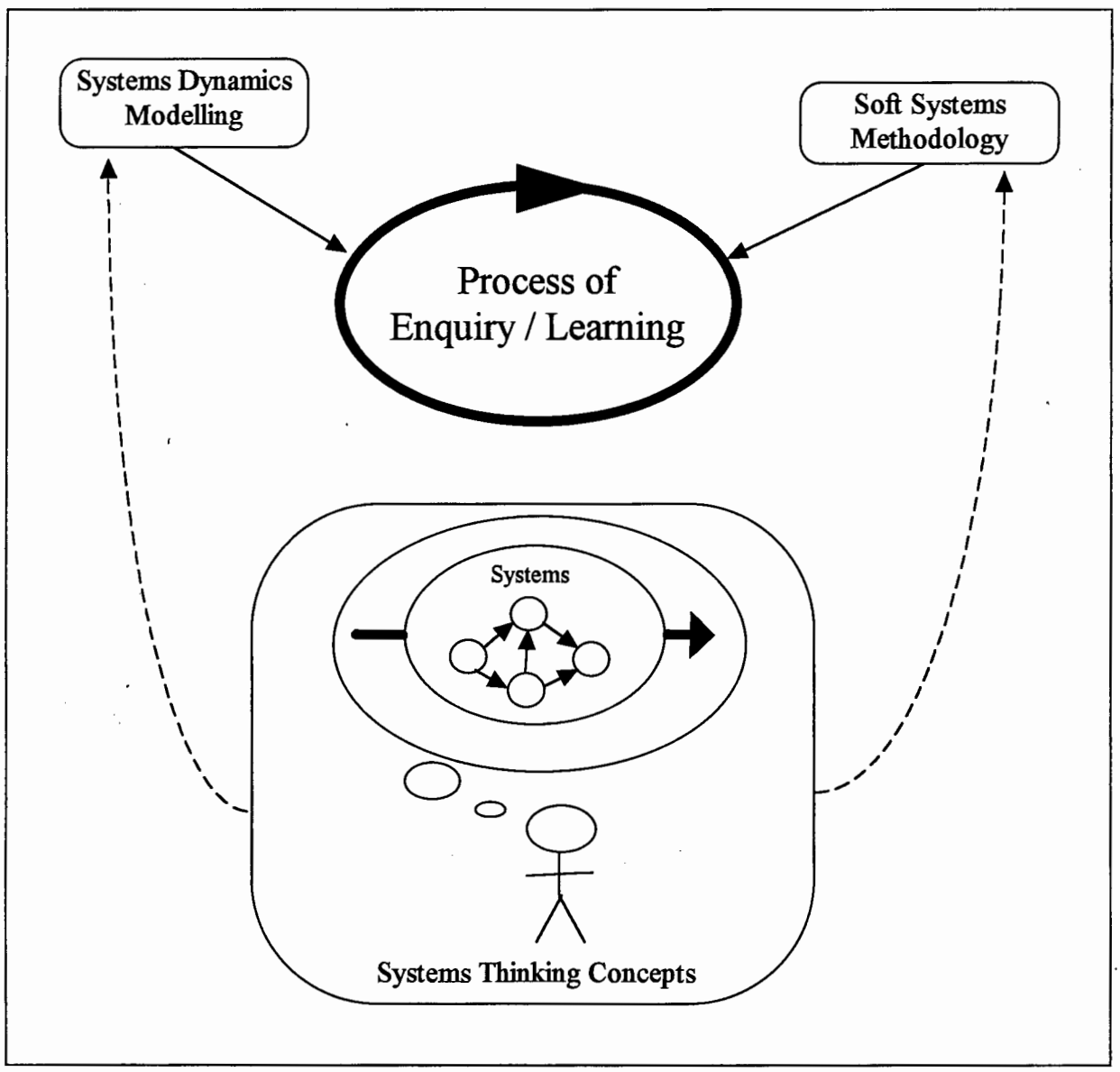


Figure 29 - A Synthesis of the Elements of Chapter 1

Within this dissertation two enquiries took place simultaneously: (i) the process of enquiry at Company XYZ, which led to purposeful action within the organisation and (ii) the learning process that the author went through as the project developed. Each of these is placed into the question-answer-test-reflection framework (see Section 1.1.4) in Figure 30 and Figure 31.

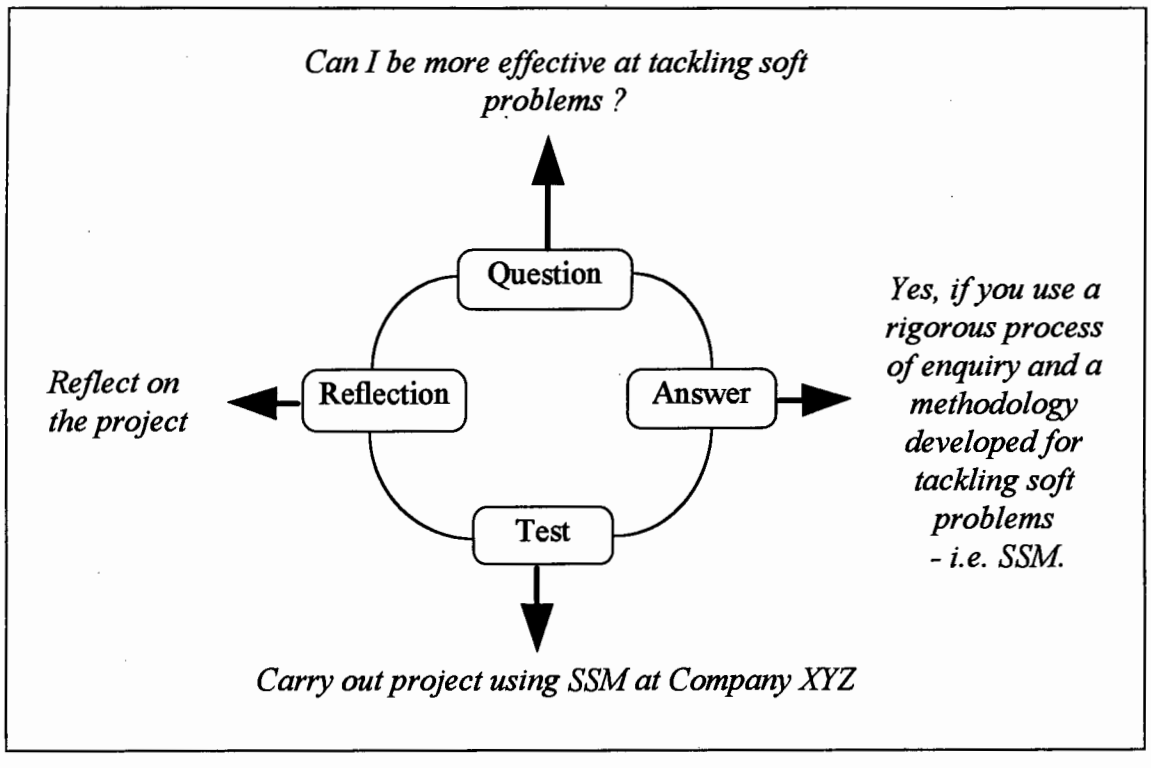


Figure 30 - The Learning Cycle for the Author

These two inquiries are at different recursive levels - the latter forming part of the former. Figure 32, illustrates this relationship.

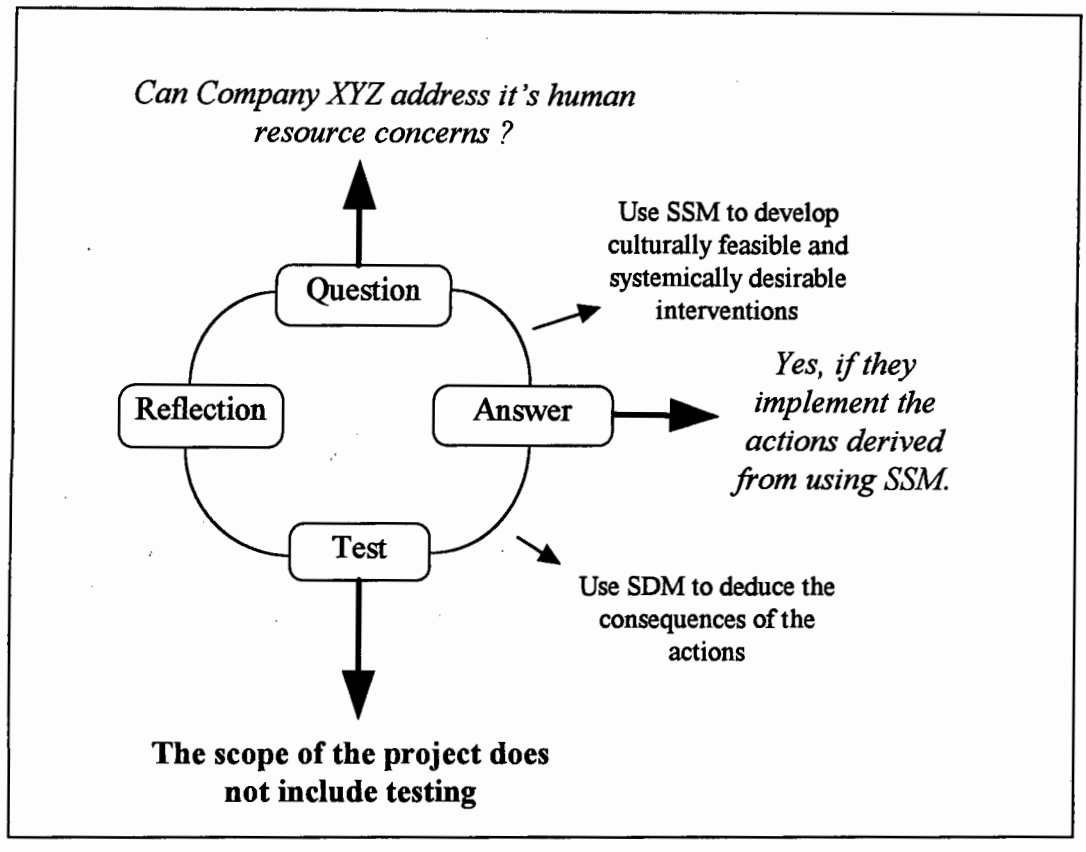


Figure 31 - The Enquiry Process for Company XYZ

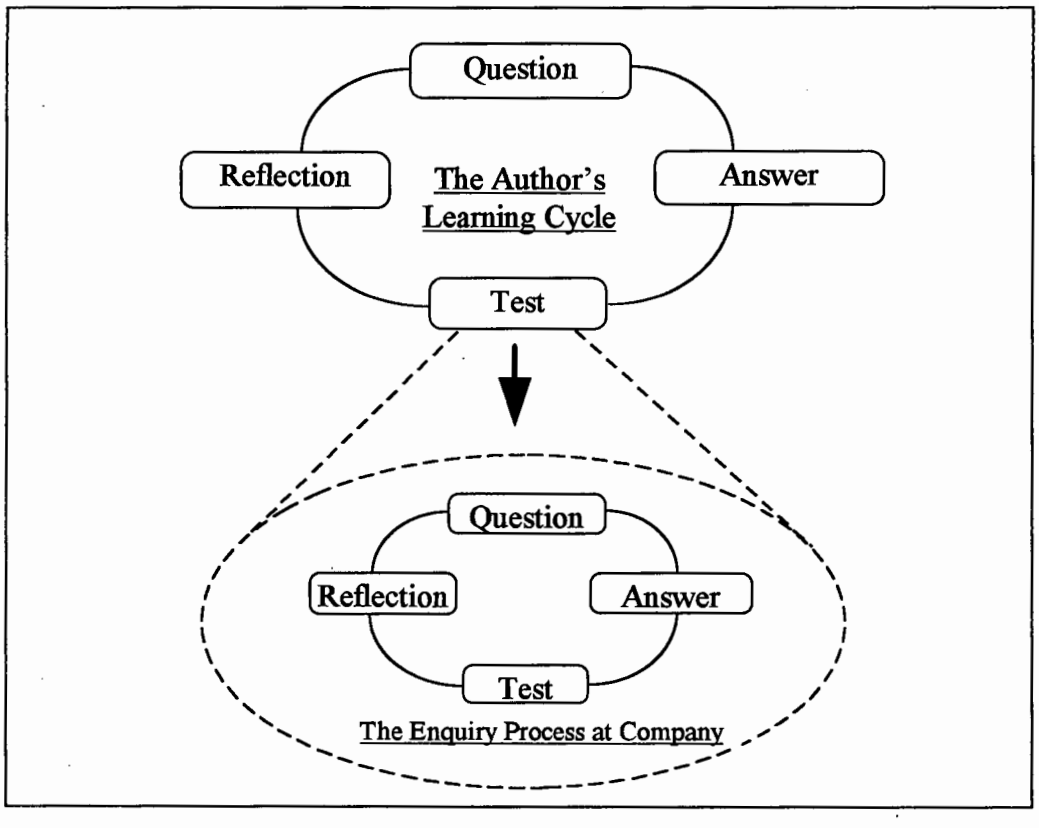


Figure 32 - Integrating the Two Inquiries

To summarise the first chapter of this dissertation a number of principles[p] will be described that will guide the rest of the project :

(i) Learning must be a key feature of the project. If learning cannot be demonstrated to have occurred, the project must be deemed a failure. This defines the rôle of the author at Company XYZ, not as a traditional problem solver, but as a facilitator of learning. He will not bring his solution of the problems, but facilitate a process in which the company generate their own culturally feasible and systemically viable interventions.

(ii) Participation is a key requirement. Including and keeping a number of divergent, perhaps contradictory, views through the project is essential. The focus must be on exploring the views for the learning that they can generate.

(iii) The use of SSM, SDM and other systems based ideas must be seen as a helpful way to conceptualise reality rather than representing reality itself. Checkland's comment must be remembered : " *..the most important point to remember .... is that 'system' is not the name of something which exists in the real world. 'System' is a means of notating the real world in a way which may or may not map on to reality..* "[57]

[p] These principles are in part from Creative Problem Solving : Total Systems Intervention (1991) by Flood and Jackson and part from the author's experience.

2. "SSM IN ACTION"[q]

Having set a philosophical and methodological base in Chapter 1, there now follows the report on the execution of the project at Company XYZ. The final chapter (Chapter 3) reflects on and synthesises the process and findings of the project as a whole.

This chapter is divided into two main parts:

- the agreed aims/objectives and involvement of the company with the project,

- the project described in terms of the seven stages of SSM.

The description of the project presents a factual record of the evolution of the project (from the author's perspective) which will serve both as a journal of the process and as a basis upon which the whole project will be evaluated in the third chapter of the report. The description follows the SSM stages as closely as possible (whilst some jumping forward and backward between stages did occur) forms a reasonable account of the development of the project in chronological order.

[q] Chapter title borrowed from Checkland & Scholes' book : Soft Systems Methodology in Action. (1990) Wiley and Sons.

2.1. Research Design

The initial contact was made with the company in July 1995. After two week's discussion and familiarisation with the aims and objectives, a project proposal was drafted and agreed. A copy of the proposal is found in Appendix 1[r].

In summary, the aim of the project was "to define the optimum human resource processes to support World Class Manufacturing at Company XYZ, within the current South African context, in order that this vision can be used to generate change within the organisation."

SSM requires that a group or Lockean Community undergoes a learning process during the process of enquiry (see Section 1.4.2). It was therefore important to agree the group that would be the focus of the learning. Prior to the project, the company had established an "HR2000" committee to address strategic human resource issues; this committee formed the core group (Group 1) of four senior personnel for the project. The project was focused on the manufacturing operation. Line managers were considered key to the success of the initiative and they became members of an extended HR2000 committee (Group 2).

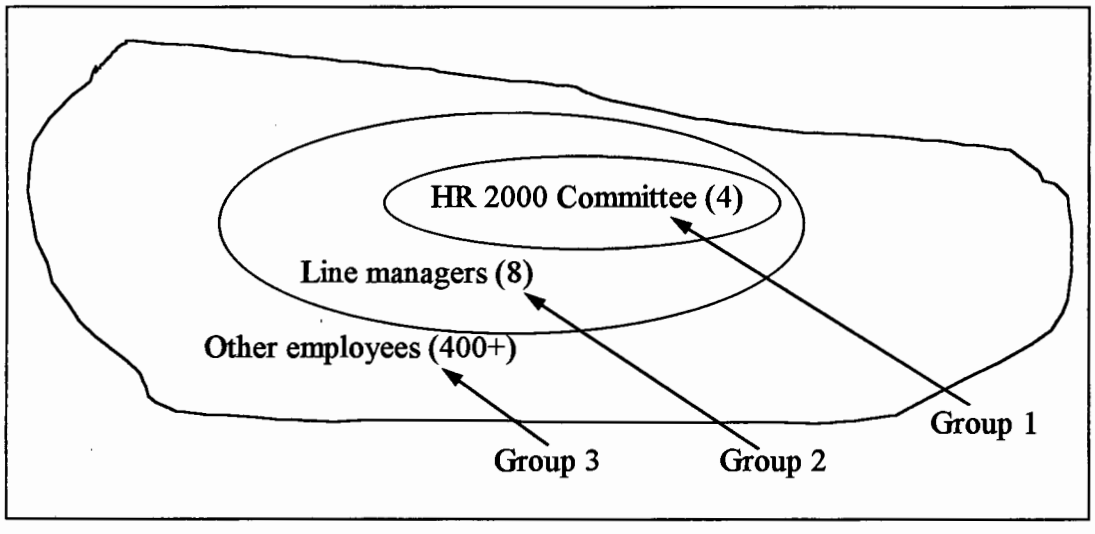


Figure 33 - The Involvement of Company Members in the Project

[r] An alternative, perhaps better, approach to defining the objectives of the project would have been to co-determine with Group 2 and Group 3 (see Figure 33). This was not done. It was one of the practical constraints under which the project was initiated.

The degree of involvement of each group could vary but may be summarised as :

Group 1	Heavily involved in the process
Group 2	Kept informed throughout
Group 3	Involved only as required

When the aims and organisation of the project were clear, the eight line managers were introduced to the aims and process of the project and their co-operation requested. This introduction took half a day.

In addition to the aims of the project specified above, it was agreed that one of the members[6] of Group 1 would also become familiar with SSM, so that if the methodology was found to be useful, a facilitator would be available within the organisation.

This section specified the parameters within which the project was carried out. The following sections describe the detail of the SSM process. The structure follows the stages of SSM from one through to seven.

[6] The person chosen was also studying on the Operations Management Development Programme and is expected to use SSM as the methodology for her dissertation. Whilst her learning about SSM is not central to the project, Appendix 5 describes the process in more detail.

2.2. Stage 1 : Immersion

Having agreed the aims of the project (described in Section 2.1 Research Design), necessarily a loose formulation of the problem, the SSM process began with no preconceived ideas of what the perceived problems actually were. Stage 1 of the SSM cycle involved immersing Group 1 in the problem situation through a series of interviews, which would form the basis of the subsequent stages.

Group 2 were asked to identify a cross section of staff to be interviewed. Emphasis was placed on including both the militant and the middle of the road, the outgoing and the quiet, the well educated and the not so well-educated. Thus, a list of some 80 people was generated .

It had been agreed that Group 1 should participate throughout the project in order to facilitate their learning about the problem situation and about SSM. Accordingly, it was necessary for them to be involved in the immersion phase interviews. It was concluded that the advantages of involving senior company personnel (in terms of their learning about SSM and the format of an enquiry based on SSM) would outweigh the dangers (namely the additional input required to facilitate the process and the complications of company personnel being involved in the research.) The main problem anticipated was that employees of the company at operator level would probably not talk freely to those at management/director levels.

The logic used to allocate interviewees to interviewers was :

(i) The author should interview a representative sample of staff.

(ii) Two of the senior managers should be allocated interviewees who would not be overly affected by their hierarchical position.

(iii) The two remaining Group 1 participants should interview as representative a sample of staff as possible.

The objectives of the interviews would be different for specific members of Group 1: the three more senior Group 1 members would be participating

in the interviews to gain insight into conducting this particular type of interview. The author and the fourth Group 1 member would be responsible for ensuring a representative description of the problem situation.

In preparing Group 1 to achieve maximum benefit from the interviews it was stressed throughout that listening and understanding the perspectives being expressed, without judging them, was critical to the success of the process. In SSM the main objective of the interviewer is not (as in virtually all other questioning exercises) to judge what the interviewee is saying; the emphasis being on understanding the reasoning behind the stated facts or feelings.

To re-enforce this point, two exercises were carried out with Group 1. The first, suggested indirectly by Checkland, was to identify the views about the purpose of a prison. Initial discussion centred around the views of Group 1, subsequently stakeholders in the system were identified and the perceptions of their views were debated. The exercise was brought back to the current situation by comparing the prison example to the company and contrasting the views of the role players in the prison system with different views from role players within the organisation. It was pointed out that the purpose of the interviews is to glean the relevant views and, thus, it must be a participative and non-judgmental exercise, the emphasis being placed on understanding the interviewee's position and logic.

Secondly the Group was asked to consider multiple perspectives on affirmative action - not just their own views but those of other stakeholders as well. Stakeholders considered included the government, the unions, management and employees. Having gathered a number of diverse opinions on the matter before the session, the author ensured divergent views were included. The example worked well, as it brought home the concept of multiple perspectives to a well known and topical issue.

Strümpfer developed a list of systems approach questions [58] used to structure interviews; the core questions were developed, into the form of a story to

describe the required structure of the interview. To demonstrate the structure of the interview, a picture was drawn to illustrate its progression. Emphasis was placed on ensuring that the interviewee initially looks forward in the interview, i.e. attempts to construct a vision or ideal state of the company/department/workgroup, before moving on to any problems. The questions to illuminate the picture are as follows :

1 Ask the interviewee to describe their vision for the company, department or workgroup. What attributes does it have (what are we trying to do - reach the moon)?

2 In order to reach the vision a number of interventions (or rockets) will have to be launched. Allow the interviewee to articulate the interventions that they consider necessary (i.e. which rockets do they choose and why?). Question them to clarify the reasoning for the chosen interventions.

3 Finally discuss the short-term issues that must be addressed before anything can happen (what is required to get into the rocket compound?).

As a further aid, interviewers were given a copy of the paper "Systems approach questions for problem situations" [58]

The data gathered in the interview process would be the key to the success of the project and it was laid down that :

- All the discussions during the interviews were confidential. Whilst the content would be used, the identity of the interviewee would not be disclosed.
- If asked about the aims and motives of the project, the interviewer would be completely frank - at the end of the interview.

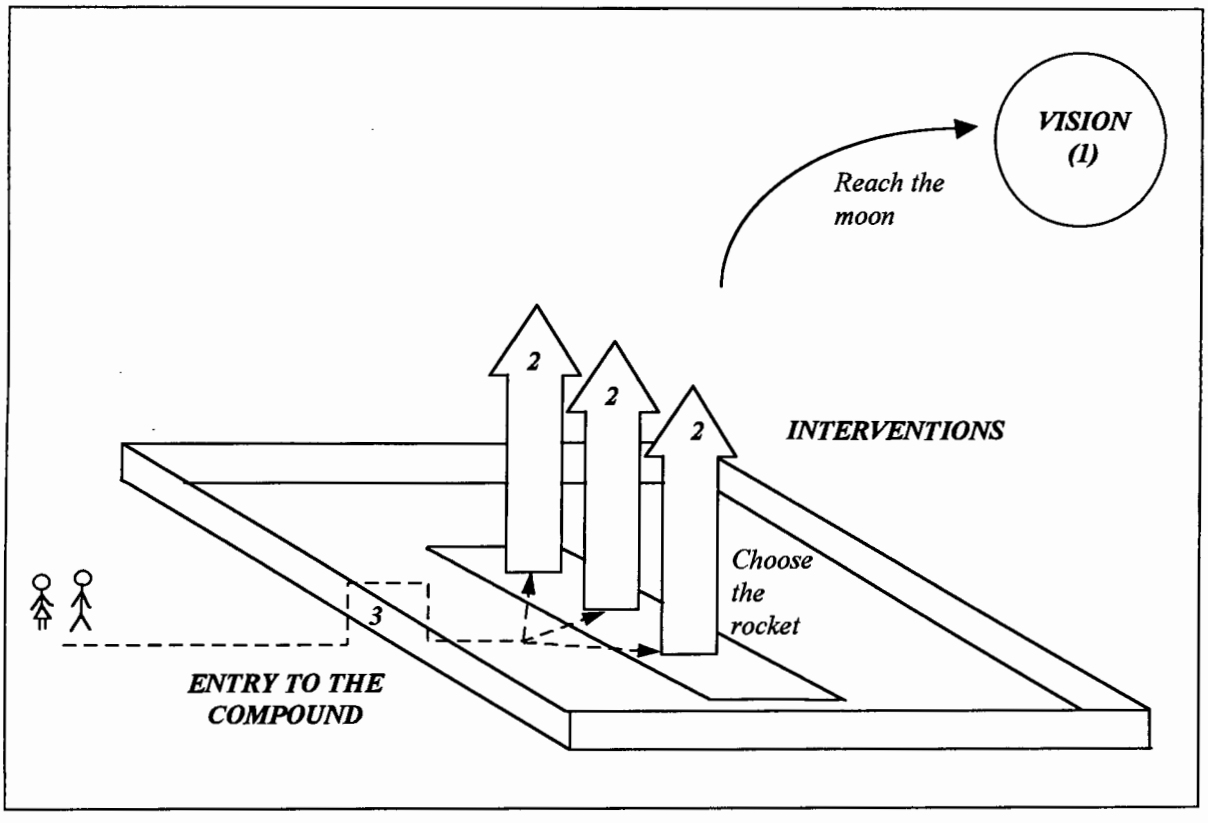


Figure 34 - The Structure of the Interview in a Picture

The effect of the hierarchical position of some of the interviewers stifling meaningful discussion was lessened by making those interviewers aware of the potential effect. Group 1 discussed their perceived effects as interviewers and how their questioning might pre-empt the responses elicited from the interviewees. To a greater or lesser degree, the group was aware of the weaknesses of this type of ethnographic research and the discussion heightened their perception of the possible causes.

In asking Group 2 for their recommendations for interviewees, effectively they were asked to define the stakeholders to be consulted about the problem situation. The potential bias on the sample was corrected in a number of ways:

- Each interviewee was asked at the end of the interview if anyone else should be interviewed and told that if others had something to say, they should contact a 'neutral' lady in the HR department who would arrange for them to be interviewed.

- One or more individuals were seen from each department and from each hierarchical level within that department; most of the managers were also interviewed.

- A number of people outside the Company were included[t].

Sixty interviews were held in total and all viewpoints recorded. Rather than include interview notes in this report, the themes coming from the interviews will be recorded. The notes will, however, be preserved and are available from the author on request.

[t] These were : the group managing director, a representative from the company's union, a local human resources consultant and an academic.

2.3. Stage 2 : Expression

Having carried out 60 interviews, Group 1 had amassed a vast amount of data, that seemed increasingly divergent and confusing. In Stage 2 of SSM, Checkland describes three analyses (see Section 1.3.2) which help to give different perspectives on the information collected during the immersion phase. In addition to the three analyses prescribed by Checkland, the interviewers were asked to construct rich pictures to describe specific interviews. Some are shown in Appendix 3 . These helped to create visual frameworks of the themes that were evident. The following sections describe each of the analyses in turn.

2.3.1. Analysis of Roles

The author's role was not that of *problem solver*, but rather of problem solving system co-ordinator. Whilst directing the project, he would not be involved in the implementation phase and therefore, had to pass on the problem solving skills to the other members of the group. The *problem solving system*, consisted of two sets of people : Group 1 and Group 2, who together were also the *problem owning system*. The *Client*, to whom the results of the project would be delivered, was the Managing Director.

2.3.2. Cultural Analysis

Key role players and their associated behaviour patterns within the company were identified and are recorded in the Table 4:

2.3.3. Political Analysis

Power is manifest not only in the hierarchical structure of the company, but also through other channels, Six managers, including the managing director, have academic knowledge having completed the "Operations Management

Development Programme" at the University of Cape Town. Their powers have increased as the ideas stemming from the course have heightened their credibility.

Table 4 - Roles

Role	*Description*
The Father Figure	easy going, kind, highly technical 'expert' role. PRO, contact man.
The Plumber	an action man, Mr Fix-It, fast, serious. Always there to mend the broken pipe.
The Elder Sister	seen to have influence and be able to facilitate on behalf of those lower down the hierarchy.
The Master of Ceremonies :	highly visible with customers, good persuasion skills, high energy, passionate.
The American Cop	as opposed to the English Bobby.
The Financial Policeman	who is trying to change to the conductor of the manufacturing orchestra
The Tough Crew	with soft centres - (3 all together)
The Steam Boat Engineer	in the thick of things, covered in grease, salt of the earth.
The Zap Man	the new-comer, change agent, looks for opportunities

Those whose experience has been in the textile sector are more able to identify changes in the business environment such as cyclical fluctuations in demand patterns. These individuals have heightened credibility because of this.

The company has been through the first phase of a total quality management (TQM) campaign which has added to the power of those with conceptual skills for problem solving and continuous improvement.

2.3.4. The Relationship between Process and Structure

In addition to the three analyses above, Checkland proposes that any problems related to the 'climate' of a particular area, may be illuminated by considering the relationship between process and structure.

During the interviews, only interviewees from the finishing department made mention of redress for mistakes made and the frustration from not identifying mistakes before processing. A rich pictures brought out the issue :

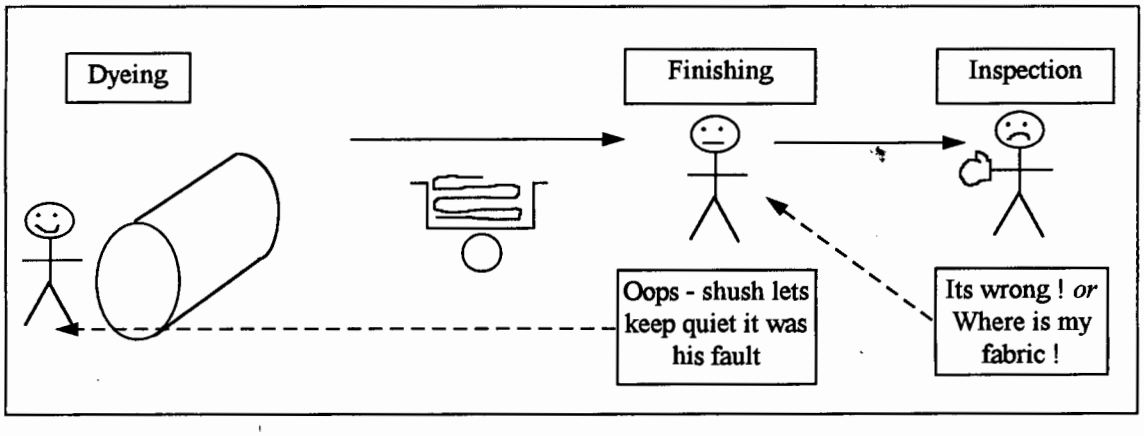


Figure 35 - A Rich Picture of Process/Structure Conflict

In an attempt to gain insight into the problem, the relationship between process and structure within the company was identified[u]. The company has four main process routes for the four major generic types of product : namely: lycra, cut-tube material, uncut-tube material and poly-cottons. The relationship between structure (taken as departmental boundaries) and process is summarised in the process flow chart (see Figure 37).

In SSM terms, the climate in the finishing department should be explicable in terms of the relationship between process and structure e.g. the dyed material crosses from the dye house into the finishing department having been de-watered but not dried (see Figure 36). Only when the fabric is dry can the result of the

[u] The information about process and structure was obtained by the author from the line managers and subsequently checked by Group 1 members.

dyeing process be assessed as acceptable or not. The dye house does not undertake a complete plan-do-check-action cycle, as checking is performed in the finishing department. The finishing department is therefore responsible for picking up mistakes not of its making or under its control.

The ideal situation would be for the dye house to take the responsibility and ownership of the activities following dyeing until the fabric is dried and checked for acceptable dyeing. The reason for the present structure is that of technology, the drying operation being technically difficult and different from dyeing.

A technique such as Work-structuring[v] could be used to examine the links between the two processes and propose sensible structural and informational links to overcome the problem.

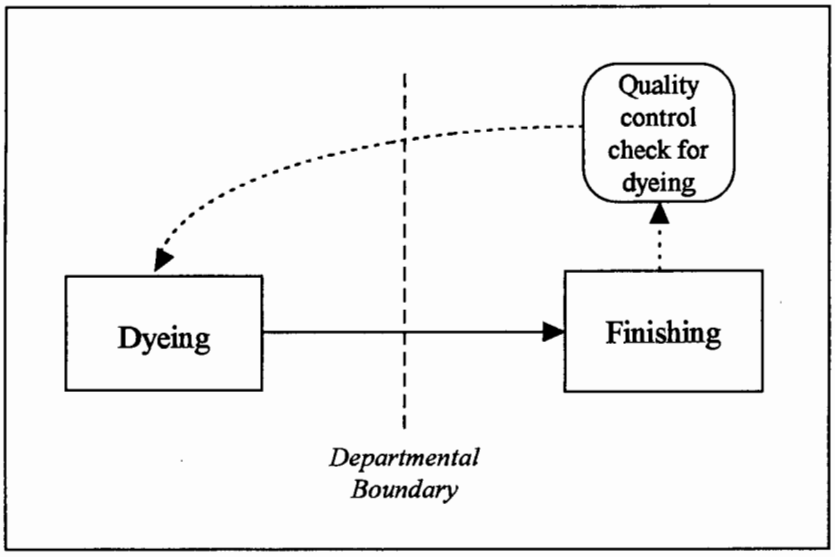


Figure 36 - A Summary of the Climate Problem

[v] Developed by Chris Schumaker. See, for example, Work-structuring and Job Design : A Manual (1989) Published by ICI Chemicals and Polymers Ltd..

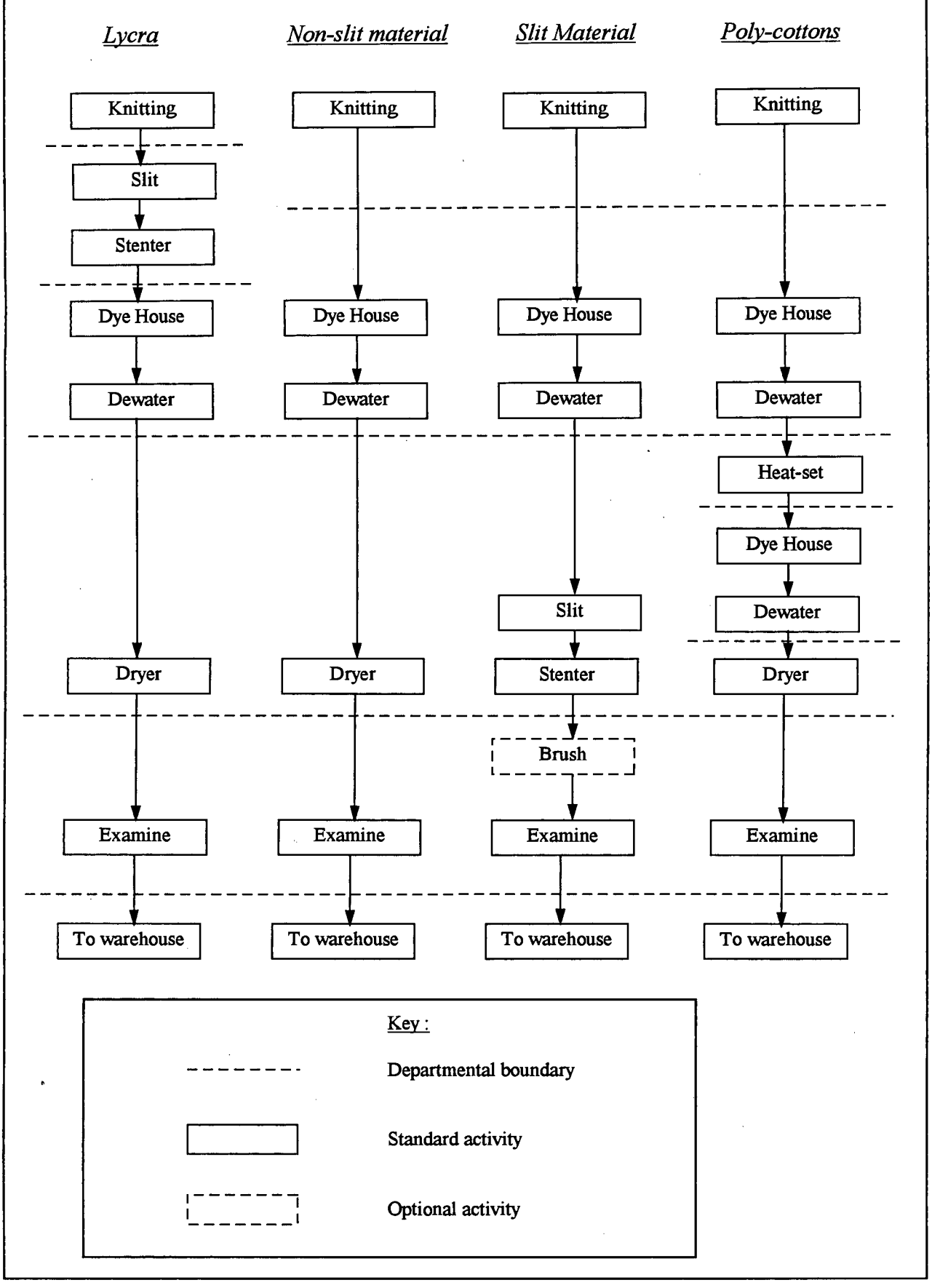


Figure 37 - The Relationship Between Process and Structure

2.3.5. Naming the Emerging Themes

The 3 formal analyses that were carried out helped to view the problem situation from different perspectives. Each analysis had clarified issues. Firstly, the analysis of the roles in the project made it clear that the company would need to internalise the skills required to facilitate an SSM process, in order for the project to be continued after the author had left. The investigation of culture had both surprised and concerned the group and led to questioning of the roles that some individuals had adopted. Secondly, some actions had been misinterpreted leading to particular 'nick-names'. Thirdly, the concept that knowledge had become power had not been fully appreciated prior to the project.

The aim of the naming stage was to identify some systems that seemed relevant to the problem situation. From the interviews a number of themes were clearly evident : e.g. remuneration and training. In order to give some rigour to the identification of relevant systems, an analysis was carried out as follows :

- Each interview was read.
- Different ideas in the interviews were labelled.
- The frequency that each label occurred was recorded

The results are shown in Table 5.

Whilst the categories in Table 5 may not be significant to the reader, they differentiated the themes for the interviewers. Through discussion, the twenty themes were distilled and some amalgamated. An illustration of this process occurred with the issues surrounding communication. Of the above list, seven themes were considered to be linked closely to "communication" : Communication, learning, involvement, follow through, authority, feedback, recognition, together constituted 50% of the issues raised.

Table 5 - The Identification of Concerns

Label[w]	*Occurrences*[x]	*% of total occurrences*[y]
Communication	16	28
Training	10	17
Involvement	5	9
Equal Treatment	4	7
Remuneration	3	5
Follow through	3	5
Working Conditions	2	3
Learning	2	3
Authority	1	2
The company	1	2
TQM	1	2
Equal Opportunity	1	2
Education	1	2
Tools for the job	1	2
Teamwork	1	2
Best practice	1	2
Feedback	1	2
Improvement	1	2
Management related	1	2
Recognition	1	2

After much debate, it was agreed to continue discussion with the five themes shown in Table 6.

[w] Only the detail of the labels taken forward to subsequent stages will be explained in detail.
[x] This analysis was carried out by the author and discussed with the members of Group 1. The table represents the themes arising from 20 of the author's interviews. In the discussions of this analysis it was agreed that the findings of the author's interviews were broadly representative of those carried out by other members of the groups.
[y] Total = 101% due to cumulative rounding errors.

Table 6 - A Description of the Themes

Theme name	Description
Communication	Problems of communication within and between departments
Remuneration	General concern with the remuneration system not being linked to any type of performance (individual or company)
Training and development	Limited access to training and development for operators and concerns about skills levels from managers
Affirmative action	The objectives of affirmative action and how it will be carried out.
The Union Perspective [z]	How the unions sees the evolution of companies to allow more joint decision making.

[z] The Union perspective was taken forward as a perspective requiring further exploration.

2.4. Stages 3 & 4 : Formulating Root Definitions and Modelling

The themes and interesting perspective described in Section 2.3.5 should be seen as a first attempt to identify those most important to the problem situation. The themes changed and evolved as the project continued.

Stage 3 & 4 explore each theme in turn and add to the understanding of the specific issue being addressed. The comparison with the real world in Stage 5 led to interesting debate about the differences between the two and fuels the definition of changes in Stage 6. Stages 3 and 4 are presented together in the following paragraphs as separating them would lead to a disjointed explanation of the ideas as they evolved.

Whilst each theme is presented and modelled on a few pieces of paper, it took a half day session on each theme to reach the stage that is documented here[aa]. It is difficult to capture the discussions, but as a result of the process the members of Group 1 reached consensus on the crux of each theme. This, however, involved many of the initial themes evolving during each session.

Before presenting the detail of Stages 3 and 4, it necessary to show how the ideas developed from Stage 2. It is difficult to be specific about when the evolution occurred or indeed exactly why. Through discussions about and reflection on the project, the themes to be modelled changed and evolved. Figure 38, illustrates the main changes that occurred.

[aa] The Author has modified the models that Group 1 constructed so that they conform with Checkland's description of a human activity system model. The original models have been included in Appendix 4 : The 'Crude' Group 1 Models from Stage 4. The main difference is that the original models formed only part of the full human activity system model. The models that were built represent the *operational system* element of the model. Performance measurement of the system was also considered in terms of measures for the effectiveness, efficiency and efficacy of the system. The author adapted this control information to a monitoring and control system and added the awareness system. It is the author's opinion that, given the strategic nature of the issues, constructing the operational system gave sufficient insight into the issue being considered.

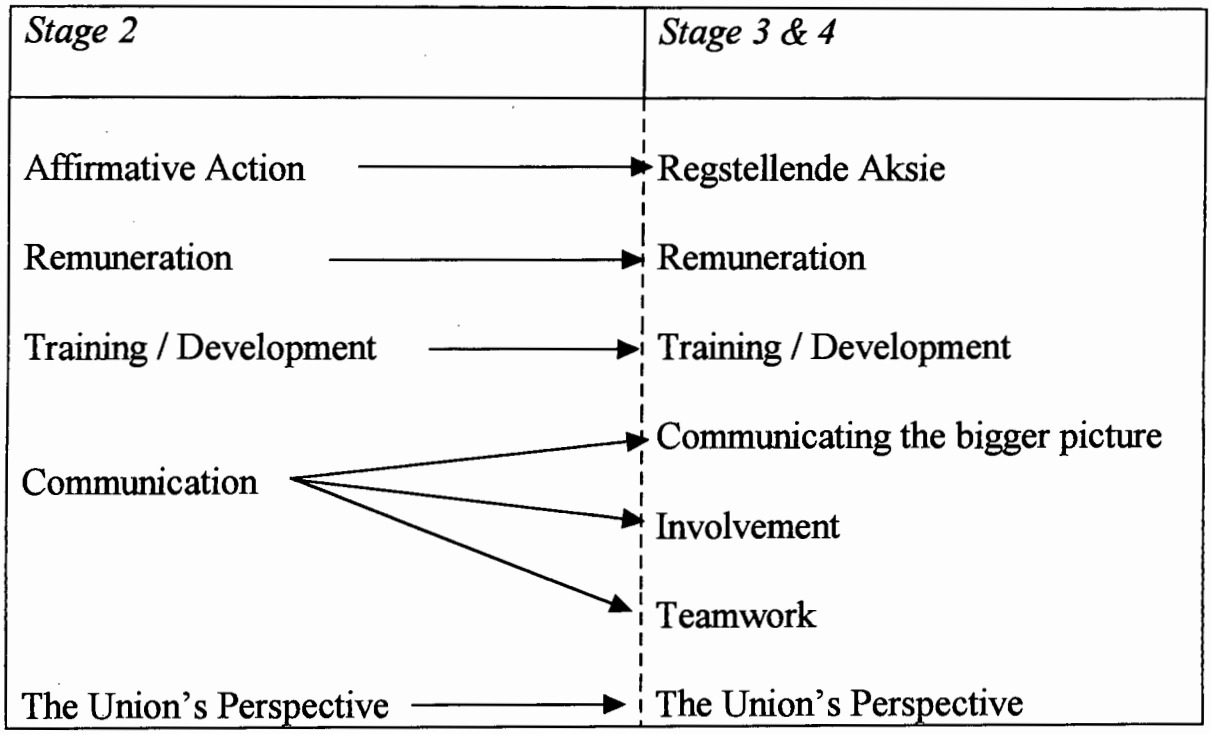


Figure 38 - The Evolution of Themes from Stage 2 to Stages 3 & 4

To deal with each in turn :

Affirmative action broadened to the concept of *Regstellende Aksie*[bb] - the Afrikaans phase literally means 'putting things right'. The thinking on affirmative action widened from the focus on 'arbitrary' promotion to a broader programme of corrective action.

Communication : Strümpfer, the author's supervisor, suggested that communication was usually a generic name for a number of more subtle underlying problems and that an attempt should be made to identify the deeper issues. As a result, the author re-read the interview notes and identified two underlying issues: The first was that the perceived lack of communication arose from employees feeling that the 'bigger picture' was being withheld from them. Secondly, lack of communication reflected the desire for involvement : 'you don't communicate with me' meaning 'you don't allow me to be involved in the decisions that affect my daily life'.

[bb] Literally translated from Afrikaans would mean 'putting things right'.

In discussions on employee involvement in decision making, the author had become aware of a general commitment to teamwork within the company. Interestingly, whilst the production areas were all structured into departmental 'teams', there was no evidence of any type of management team. Thus, teamwork was added to the list of themes to ensure that the concepts would be explored and discussed further.

The other themes, remuneration, training and development and the Unions' perspective, remained largely unchanged.

Each theme is now discussed in more detail.

2.4.1. Communicating the Bigger Picture

Communication was the most frequently mentioned theme from the interview stage. Initially the group looked directly at how to improve communication. These models are included in Appendix 2, this section only considers the second phase of discussion.

In subsequent discussions with the author's supervisor, the suggestion was made to look for underlying reasons giving rise to the claims of poor communication. Communication should be viewed as a generic name for a number of underlying issues. In re-reading the interviews, two underlying themes. Firstly there was a desire to know about the 'bigger picture'. Secondly there was the wish to be more involved in decision making concerning the operators' local environment.

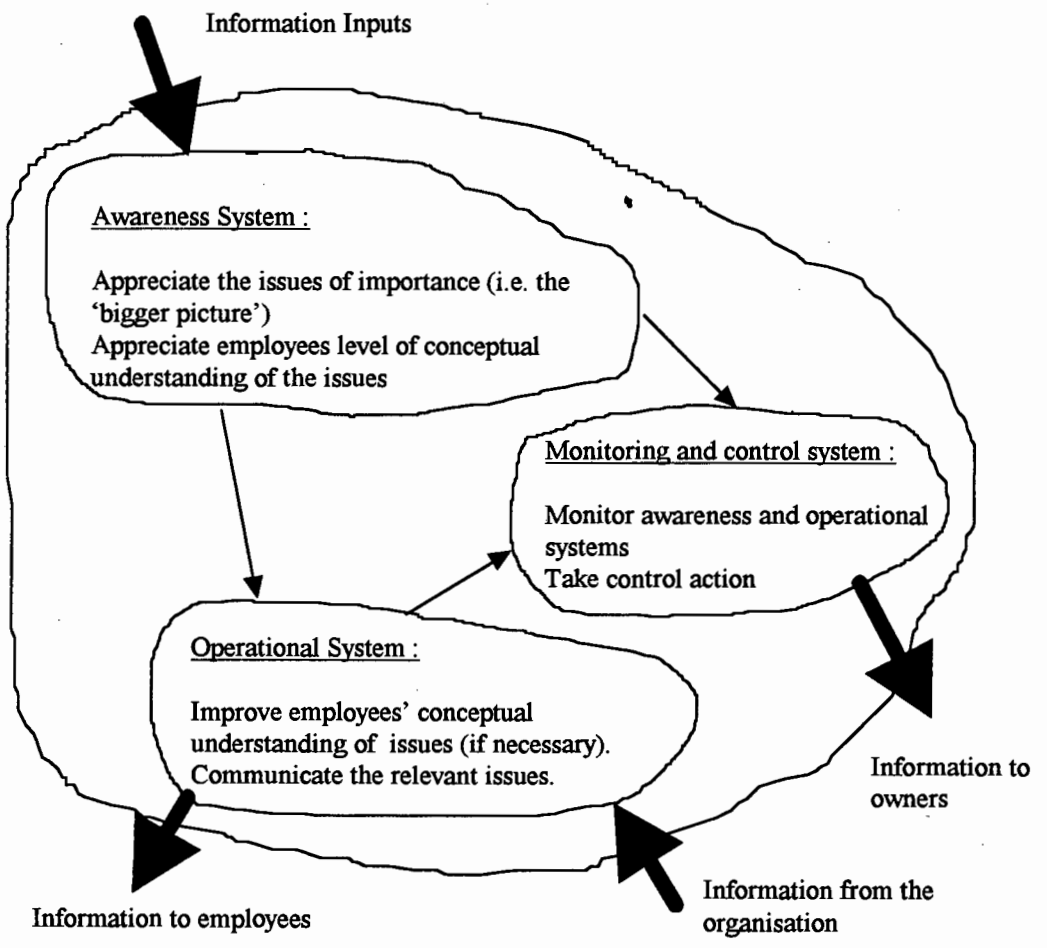
A root definition was constructed for a system to communicate the bigger picture : 'A professionally manned system to communicating the 'bigger picture' to all employees.' The models are presented on the following pages.

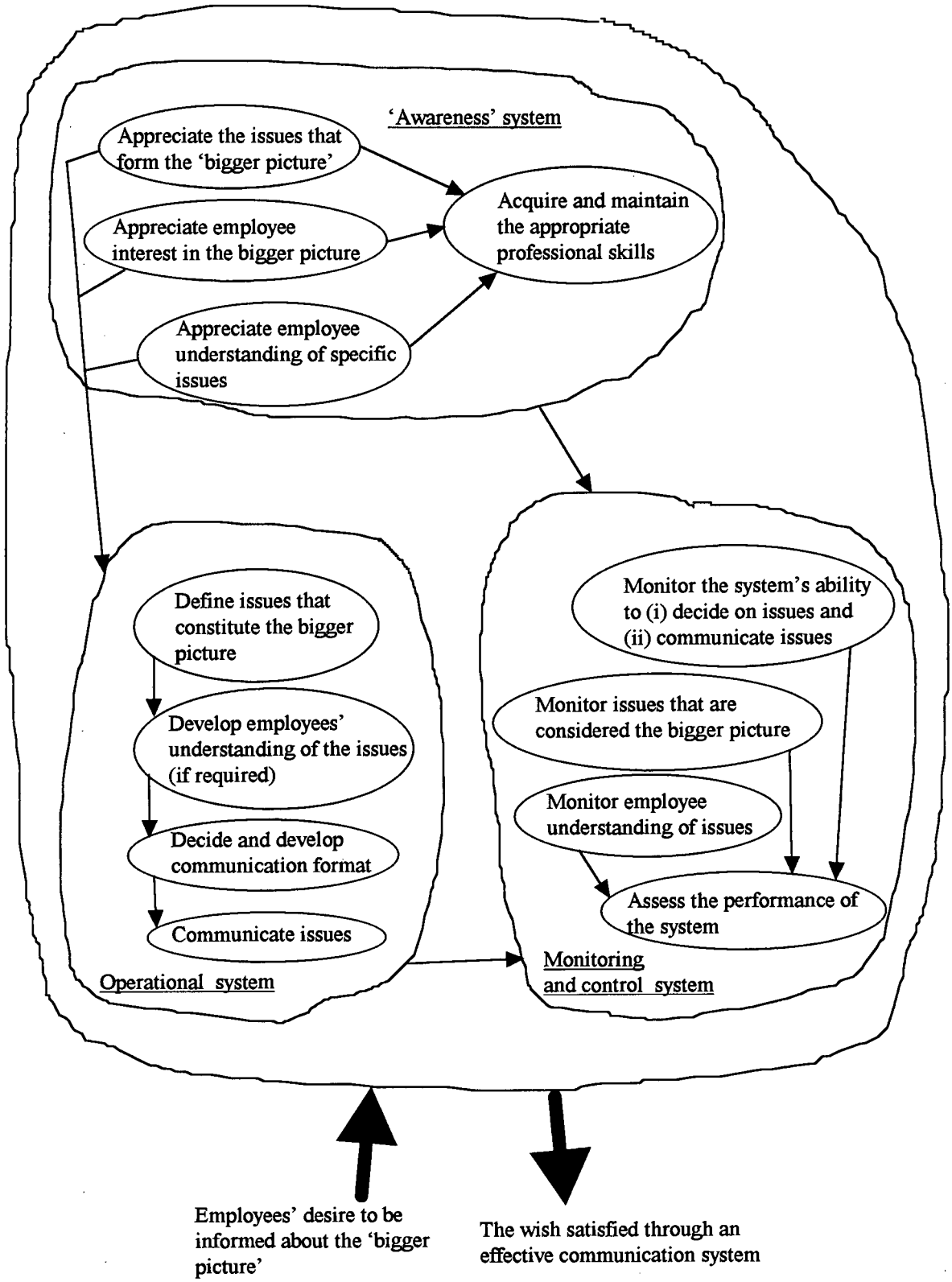
Definition : A professionally manned system to communicate the 'bigger picture' to all employees.

Transformation : Employees without knowledge/understanding of the 'bigger picture' ⟹ Employees with knowledge/understanding of the 'bigger picture'

Beneficiary Hurt	All employees Those with connections to glean bigger picture (information is power?)
Actors	Management, HR
Worldview	Knowledge of the bigger picture will allow better decisions making and realism.
Owner	Managers in contact with specifics of the bigger picture
Environmental constraints	Understanding of the information to be transferred

The general structure of the system described in the root definition above :




'Awareness' system
Appreciate the issues that form the 'bigger picture'
Appreciate employee interest in the bigger picture
Appreciate employee understanding of specific issues
Acquire and maintain the appropriate professional skills
Define issues that constitute the bigger picture
Develop employees' understanding of the issues (if required)
Decide and develop communication format
Communicate issues
Operational system
Monitor the system's ability to (i) decide on issues and (ii) communicate issues
Monitor issues that are considered the bigger picture
Monitor employee understanding of issues
Assess the performance of the system
Monitoring and control system
Employees' desire to be informed about the 'bigger picture'
The wish satisfied through an effective communication system

2.4.2. Involvement in Decision Making

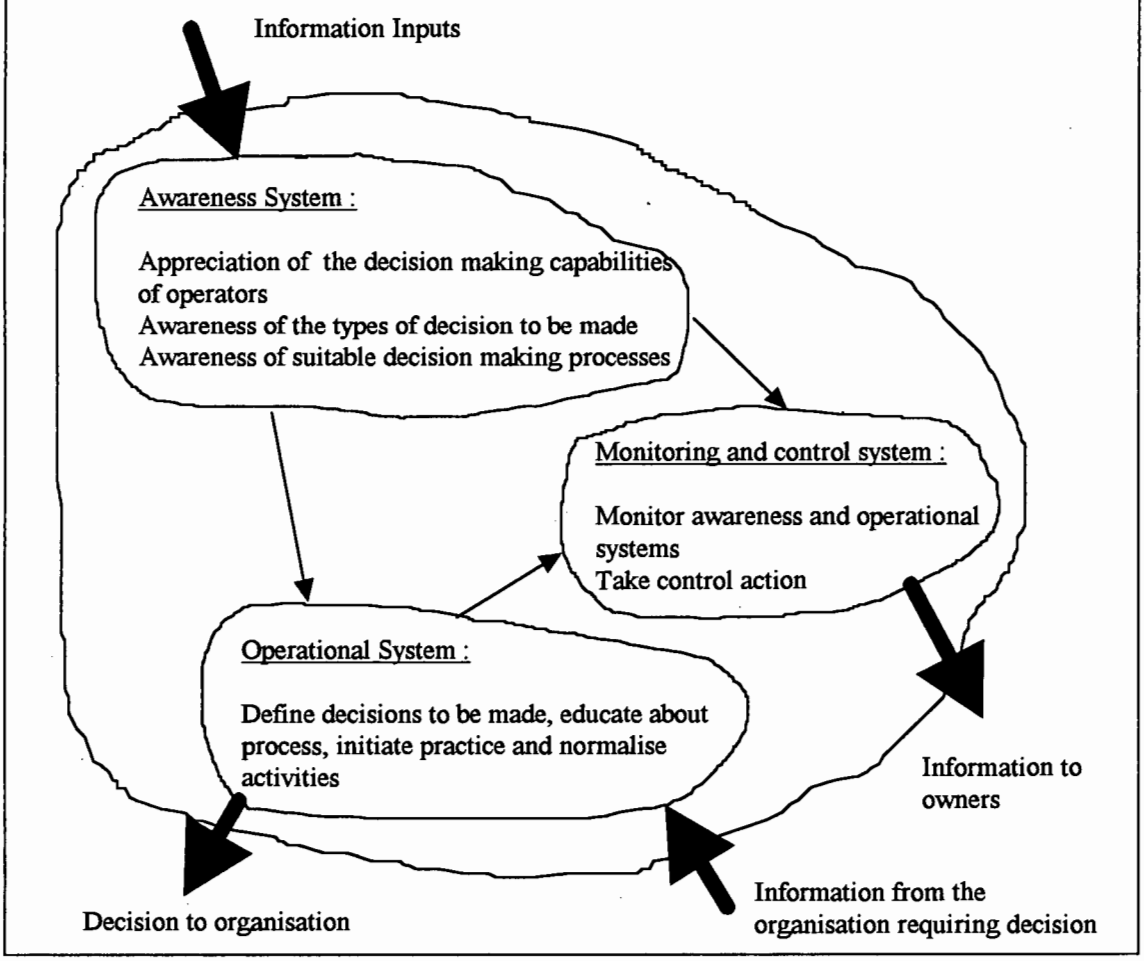
The second issue that emerged in communication was the wish to be more involved in making decisions that concerned the operators' local environment. A simple root definition was constructed :

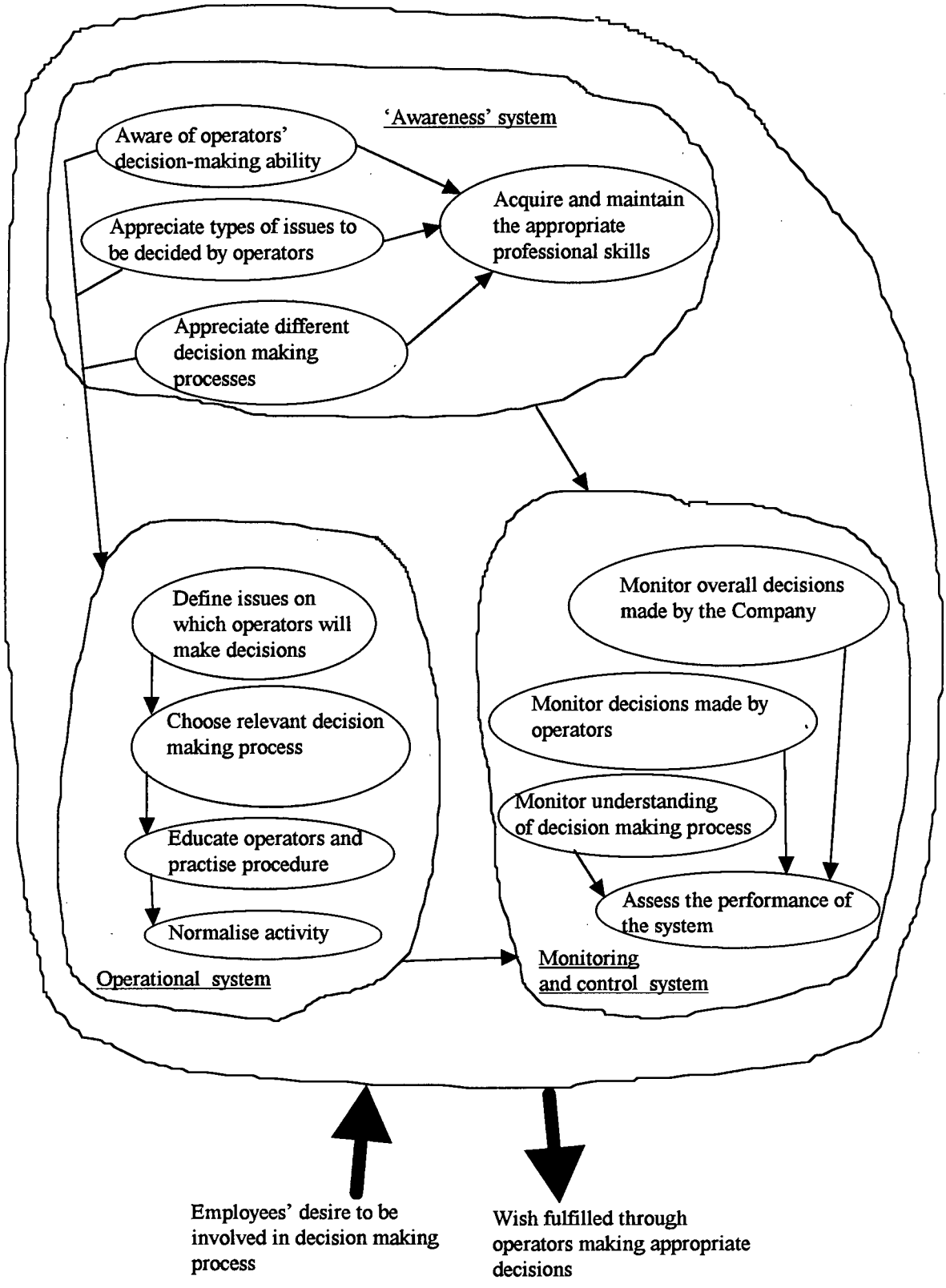
Definition : A system to enable employee involvement in local decision making.

Transformation : Employees without involvement in decisions that effect them ⟹ Employees involved in decisions that effect them

Beneficiary Hurt	All employees Managers
Actors	All employees
Worldview	Involvement in local decision making will promote ownership and responsibility which are desirable
Owner	Management
Environmental constraints	Understanding of the decision making process and wider context within which the impact of the decisions will be felt

The general structure of the system described in the root definition above :




'Awareness' system
Aware of operators' decision-making ability
Appreciate types of issues to be decided by operators
Appreciate different decision making processes
Acquire and maintain the appropriate professional skills
Define issues on which operators will make decisions
Choose relevant decision making process
Educate operators and practise procedure
Normalise activity
Operational system
Monitor overall decisions made by the Company
Monitor decisions made by operators
Monitor understanding of decision making process
Assess the performance of the system
Monitoring and control system
Employees' desire to be involved in decision making process
Wish fulfilled through operators making appropriate decisions

2.4.3. Remuneration

Unhappiness was expressed at all levels within the organisation about the remuneration system. Many possibilities for change were proposed, the general thrust being to move towards a more performance related reward system.

A selection of possible root definitions was as follows :

No.	Label	Definition
1	Pay by projects	A system to reward employees according to specific projects to which they contribute.
2	Pay for skills	A system to reward employees according to the relevant skills that they have demonstrated.
3	Piece work	A system to reward employees in direct proportion to the output achieved in a specified period
4	Pay for company performance	A system to reward employees in proportion to the success of the company.
5	Pay for individual performance	A system to reward employees in proportion to their effort or contribution to the aspects of their job critical to the success of the company.

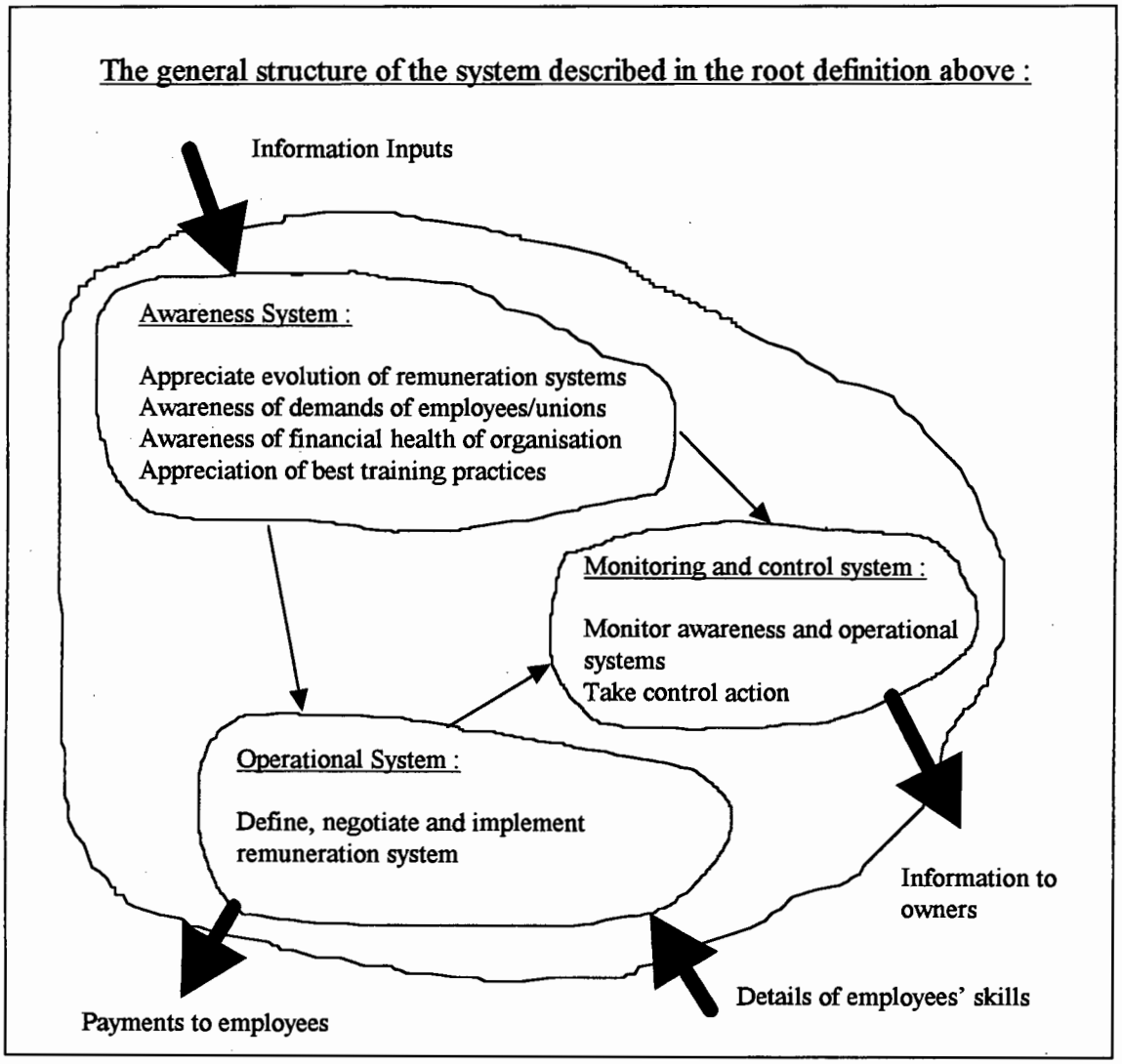
Given that the possibilities for remuneration systems are endless, the group decided to consider transformations that would establish a link between, firstly, employees skills and their value to the company and secondly, a system to link remuneration to company performance

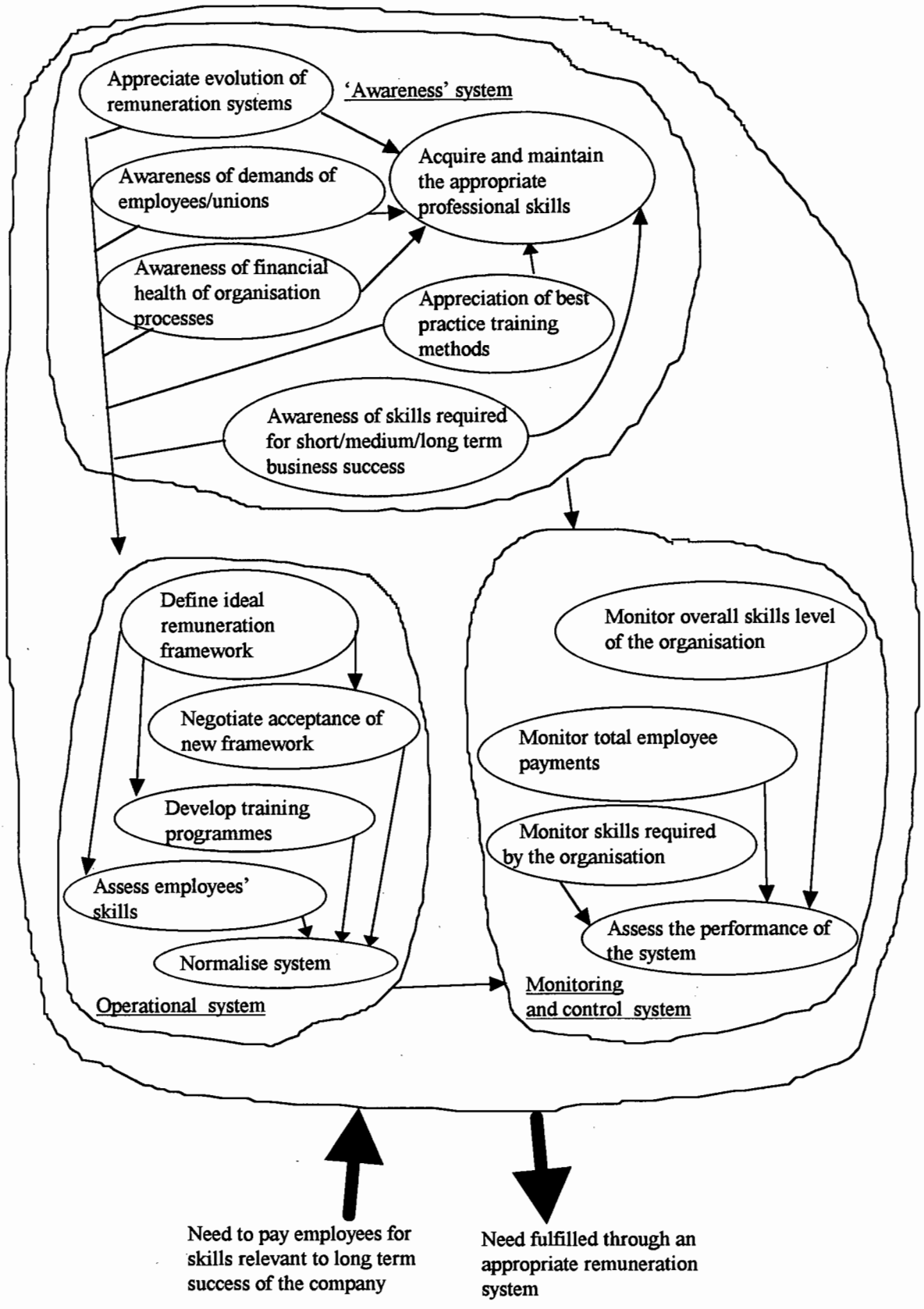
A general BATWOE for the two systems

Transformation	From an historical remuneration system to one that reflects a performance element.
Beneficiaries	Employees who perform well according to the specified system
Hurt	Employees who are not motivated by the factors expressed by the system
Actors	Management, Human Resource Department
Weltanschauung	Remunerating employees for their contribution to the organisation will benefit the organisation
Owners	The wider group, General Manager, Managing Director
Environmental constraints	Previously negotiated agreements with the union

Definition : *A system to remunerate employees in accordance with the skills required for the long term success of the company.*

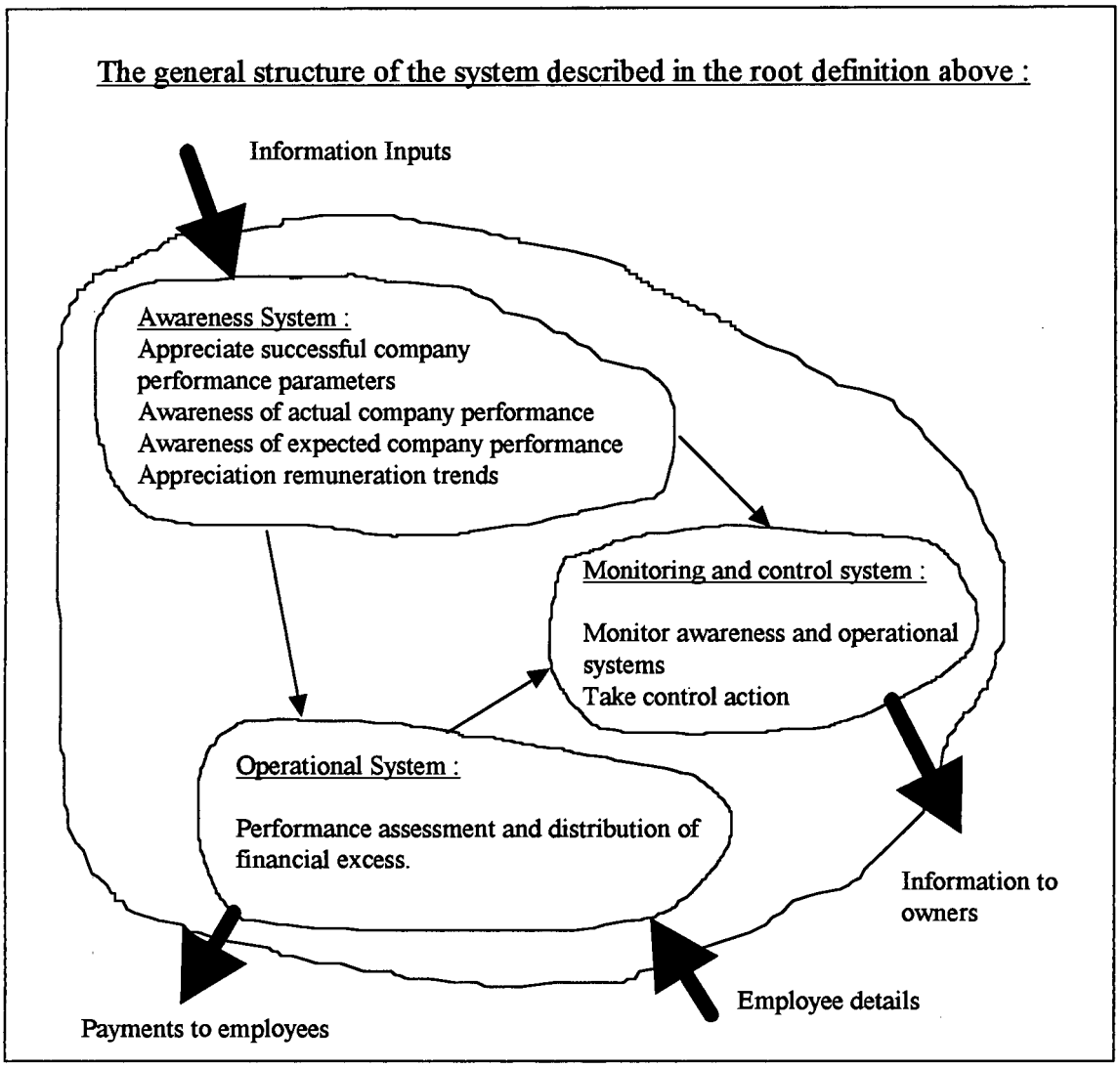
Transformation : Employees paid using historical system ⇒ Employees paid according to the skills they acquire

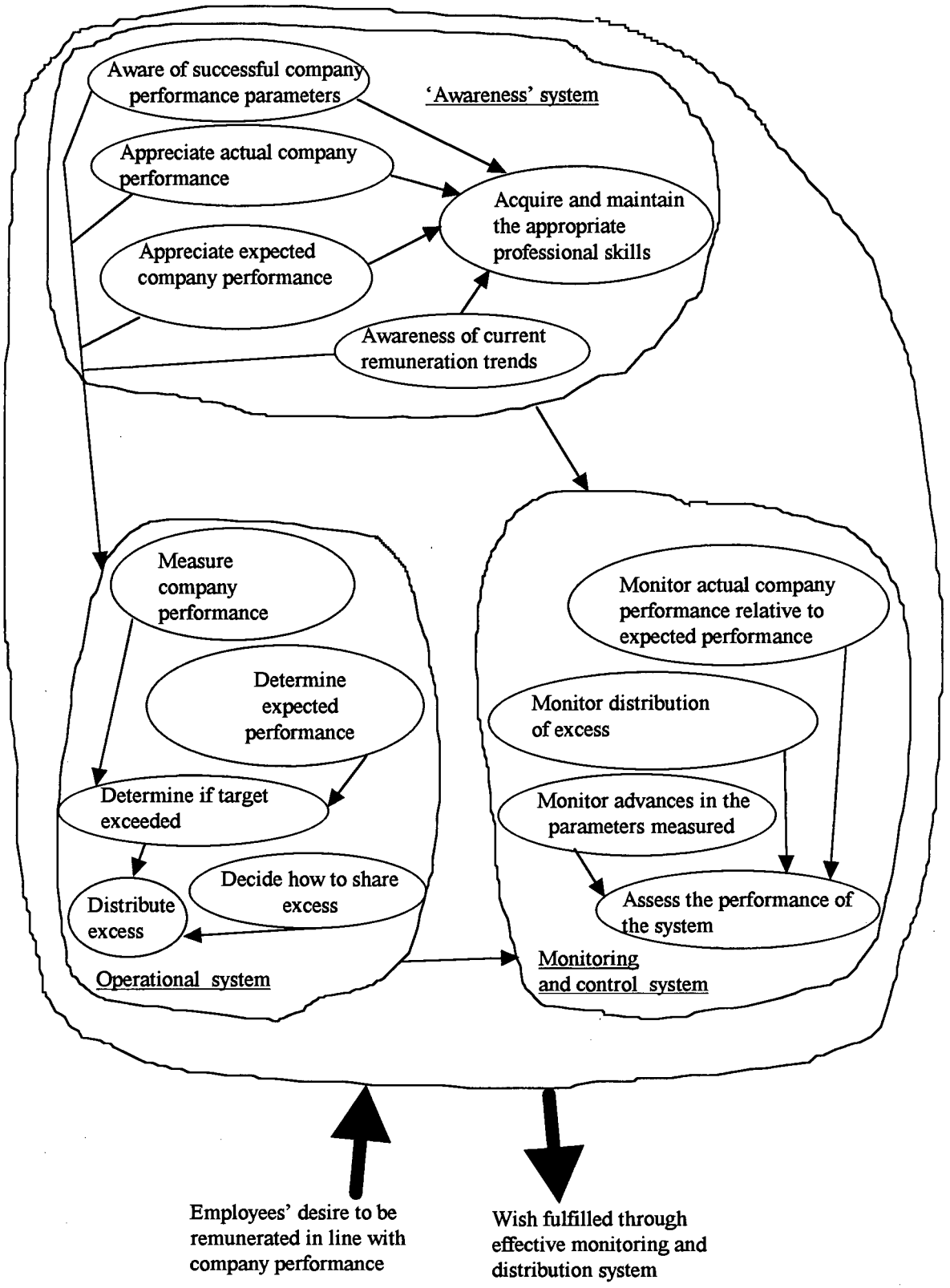



Appreciate evolution of remuneration systems
'Awareness' system
Acquire and maintain the appropriate professional skills
Awareness of demands of employees/unions
Awareness of financial health of organisation processes
Appreciation of best practice training methods
Awareness of skills required for short/medium/long term business success
Define ideal remuneration framework
Negotiate acceptance of new framework
Develop training programmes
Assess employees' skills
Normalise system
Operational system
Monitor overall skills level of the organisation
Monitor total employee payments
Monitor skills required by the organisation
Assess the performance of the system
Monitoring and control system
Need to pay employees for skills relevant to long term success of the company
Need fulfilled through an appropriate remuneration system

Definition : A system to remunerate employees in accordance with the performance of the company

Transformation :	Employees paid using historical system	⇨	Employees paid according to the performance of the company




Aware of successful company performance parameters
'Awareness' system
Appreciate actual company performance
Acquire and maintain the appropriate professional skills
Appreciate expected company performance
Awareness of current remuneration trends
Measure company performance
Determine expected performance
Determine if target exceeded
Distribute excess
Decide how to share excess
Operational system
Monitor actual company performance relative to expected performance
Monitor distribution of excess
Monitor advances in the parameters measured
Assess the performance of the system
Monitoring and control system
Employees' desire to be remunerated in line with company performance
Wish fulfilled through effective monitoring and distribution system

The discussions confirmed that any change to the remuneration system for the operator level employees would have to be implemented in consultation with the union.[cc] The union has become wedded to the concept of collective bargaining and alteration to the traditional remuneration system may require a premium being negotiated on top of the collectively bargained remuneration level. The need for change is, however, acknowledged and warrants progress towards a new system.

[cc] In the company's case the union is SACTWU - the South African Clothing and Textiles Workers Union.

2.4.4. Training

The term training includes the areas of training, development and education. Of all the issues, the need for training was identified consistently at all levels within the Company. Managers saw inadequate training as a weakness, because of lack of skills at operator and supervisor level. Operators generally saw the acquisition of skills as desirable and as a route to increased remuneration and personal advancement. In defining the purpose of training a rich picture emerged :

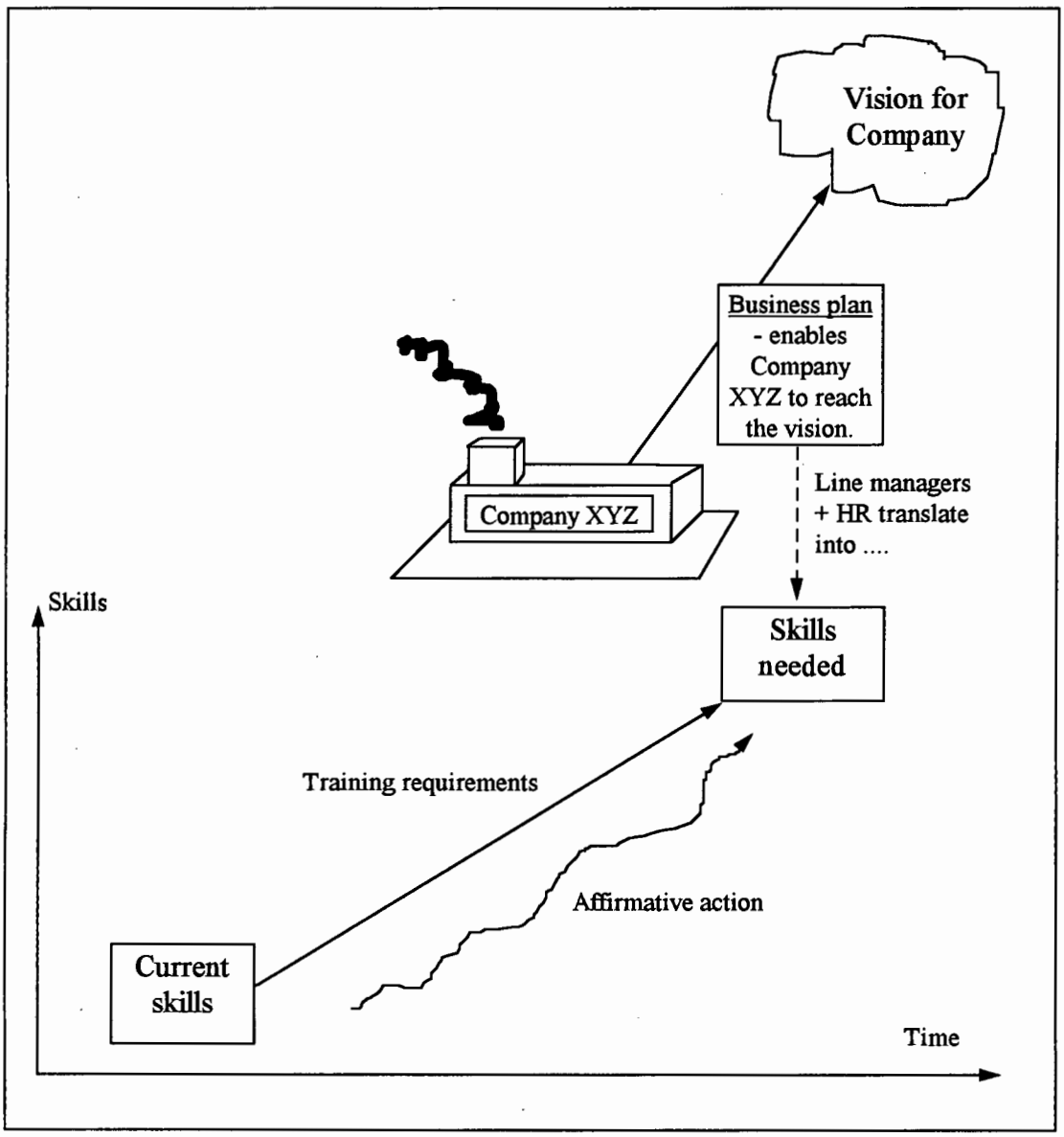


Figure 39 - The Purpose of Training and Development

The purpose of training is to enable the company to achieve its vision for the future as defined in the business planning process. Line managers are responsible, with assistance from the Human Resource Department, for defining the skills required to enable fulfilment of the business plan. Training will raise the skills in the company to the required level. In addition affirmative action training will specifically target disadvantaged communities within the company.

It was agreed that the annual training programme, particularly for total quality training, was more realistically summarised as follows :

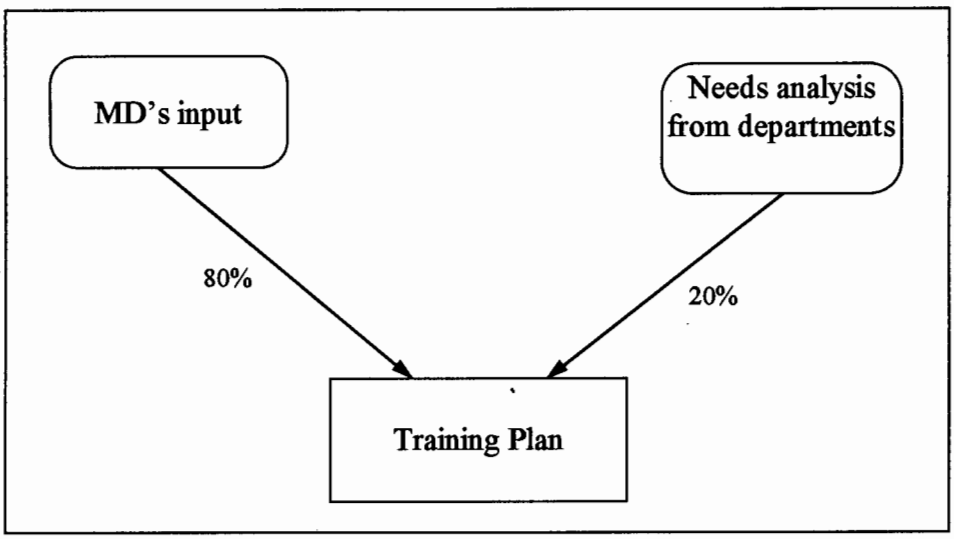


Figure 40 - Input to Total Quality Training

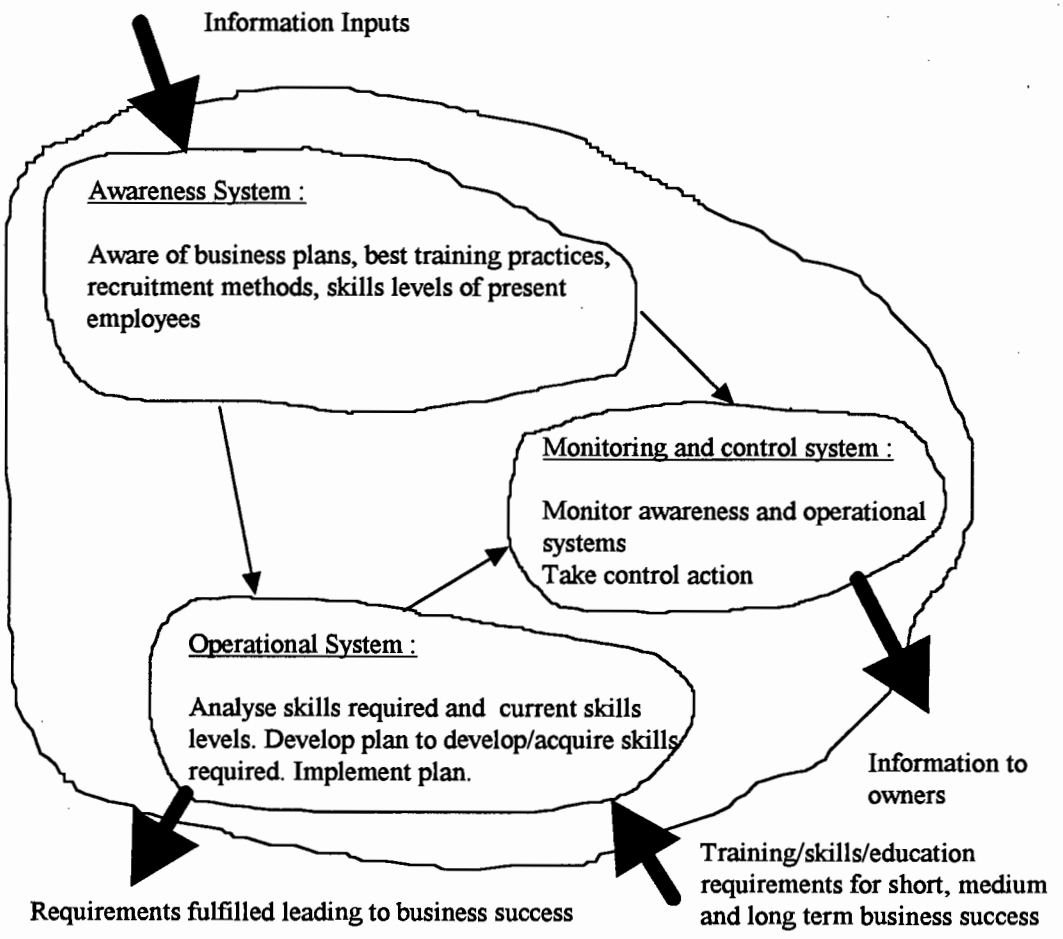
Discussion centred around the purpose of training and the creation of a model, the root definition of which was 'a system to develop or acquire the skills, education and training that the company will need to fulfil its business plan in the short, medium and long term'.

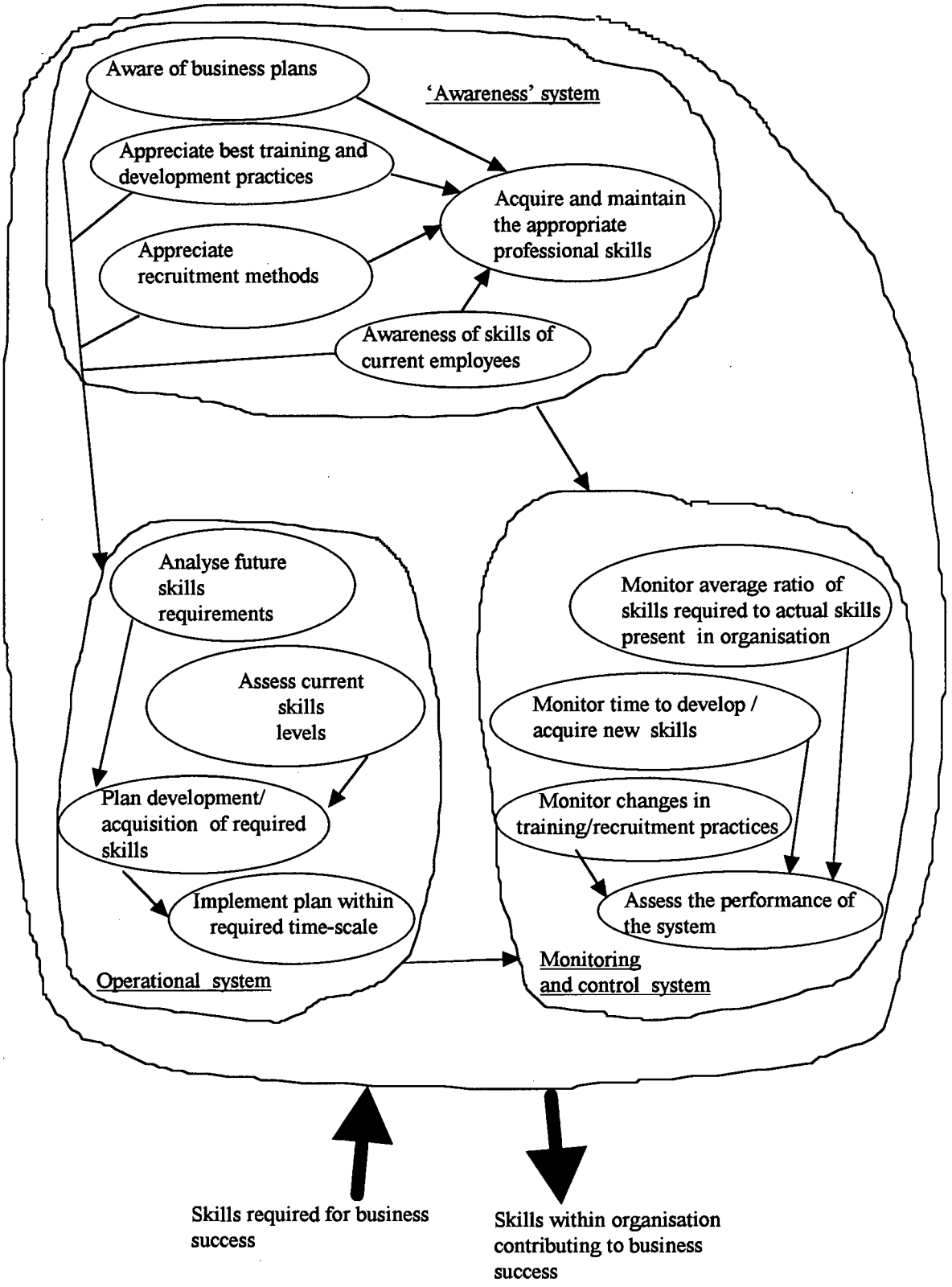
Definition : *A system to develop or acquire the skills, education and training that the company will need to fulfil its business plan in the short, medium and long term.*

Transformation : Employees with 'random' skills ⟹ Employees with specific skills that will help the organisation attain its vision

Beneficiary	Company, customers
Hurt	Those who do not wish to gain the skills which will help the company
Actors	HR department, line managers
Worldview	Relevant skills will benefit the organisation
Owner	GM, MD
Environmental constraints	The ability to acquire the required skills. A budget for training. Profitability of the company for the budget to exist.

The general structure of the system described in the root definition above :




Aware of business plans
'Awareness' system
Appreciate best training and development practices
Acquire and maintain the appropriate professional skills
Appreciate recruitment methods
Awareness of skills of current employees
Analyse future skills requirements
Assess current skills levels
Plan development/ acquisition of required skills
Implement plan within required time-scale
Operational system
Monitor average ratio of skills required to actual skills present in organisation
Monitor time to develop / acquire new skills
Monitor changes in training/recruitment practices
Assess the performance of the system
Monitoring and control system
Skills required for business success
Skills within organisation contributing to business success

2.4.5. Teamwork

The company subscribes to the merits of teamwork but acknowledges that improvements are possible. The discussions centred on the following questions :

Why do we use teams ?

What is their purpose ?

What do they do well?

Why are they better ?

How and why are they formed ?

A number of perspectives were generated:

Teams offer an opportunity to express oneself

Teams offer an opportunity to participate in decision making

Teams are a mechanism to solve problems

Teams are more likely to develop long term (sustainable) solutions

Teams offer a wider base of information from which to make decisions

Teams ensure buy into solutions (by allowing participation in decision making)

Teams enable a better systemic understanding of a problem to be obtained

Teams develop a shared understanding of a problem

Teams have a more holistic view of a problem

Teams help to break down barriers

Teams release managers to manage

Teams empower people.

Three main themes emerged as a result of the discussions and are shown in Table 7.

Table 7 - Themes Emerging from Discussions about Teamwork

No.	*Label*	*Description*
1	Management Team	It was acknowledged that the management was in fact not a cohesive team, a system therefore was required to transform them into one.
2	Real team areas	The 'team areas' within the factory should more realistically be called communication forums. A system is required to transform them from communication forums to real team areas .
3	Team selection	It was acknowledged that, whilst project type teams had been very successful, there had been no rigorous selection of an appropriate team containing members with the required skills. A system to select individuals for a team, in order that the team will stand a greater chance of functioning well.

By the modelling stage, it was apparent that similar discussions would benefit Group 2, if not an even wider group. For the sake of completeness, however, it was decided to build a human activity system model of Label 3, team selection. As this does not add significantly to the discussion here, the basic model can be found in Appendix 4.

2.4.6. Regstellende Aksie[dd]

The subject of regstellende aksie arose from the interviews, mainly in the form of access to training and development and perceived unequal 'perks' for positions of similar status. It was requested that the SSM framework be used to explore the company's stance on regstellende aksie. Accordingly comments from the interviews and perspectives that had been gained from a previous 'warm up' exercise[ee] for the project were discussed.

General Background Comments

1. There is a need for education about regstellende aksie
2. Regstellende aksie implies opportunities for those disadvantaged by apartheid
3. The aims of regstellende aksie should be for the company to become more representative of local demographics, especially at the management level.
4. The main route for regstellende aksie to occur is through training and development
5. The company must avoid window dressing
6. Succession planning could be regstellende aksie routed
7. Transparency is the key to successful regstellende aksie programmes
8. Post creation is not viable for the company as it is too small
9. One must define the target group for regstellende aksie (blacks/coloured/Asian etc. / female)
10. Regstellende aksie will a budget.
11. The production line managers need to be educated about the programmes and their commitment sought. A real danger is for them to feel 'side-lined'
12. Does affirmative action address actual discrimination, educational discrimination, or do all non-whites qualify for affirmative action opportunities?
13. There are problems with operators who have slowed their pace of work down. There will need to be accelerated development for these people.
14. There is a need to change the attitude of employees.
15. Communication of regstellende aksie progress/details is important
16. Should the company consider replacement of incompetent white managers ?
17. Should white employees who have exceeded their potential be repositioned ?
18. The impression that only managers (whites) have opportunities.

The objective of an affirmative action/regstellende aksie programme is to help redress the inequalities of apartheid with the consequent need to

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[dd] Literally translated from Afrikaans means "putting things right".

[ee] At the beginning of the project an exercise was carried out to introduce Group 1 to multiple perspectives. Checkland's example of views of a prison was used first. The second exercise was to consider perspectives on affirmative action. The author had carried out a brief exercise to glean divergent perspectives before the group exercise. See section 2.2 for more details.

have a distribution of race groups representing the demographics of the local population particularly in higher management positions. The first root definition was thus 'a system to transform the demographics of the company to be representative of the Western Cape'.

The group had experience of other companies restructuring through a post creation philosophy - new managerial positions would be created, with good salaries but little power or influence on the running of the organisation. The consensus was that this type of approach was very short term and would hinder the organisation in the future.

The view emerged that there was, no doubt, much undiscovered talent within the organisation, arising either from deprivation of educational opportunities, or being passed over on grounds of colour. A second definition was formulated : ' a system to identify and action opportunities for those who have been disadvantaged by apartheid'.

A third theme was the need for all employees to be informed about the regstellende aksie policy (RAP), the opportunities afforded by the policy and those who had availed themselves of opportunities. The third definition thus became : 'A system to inform employees about regstellende aksie, the opportunities available and those who had taken opportunities.'

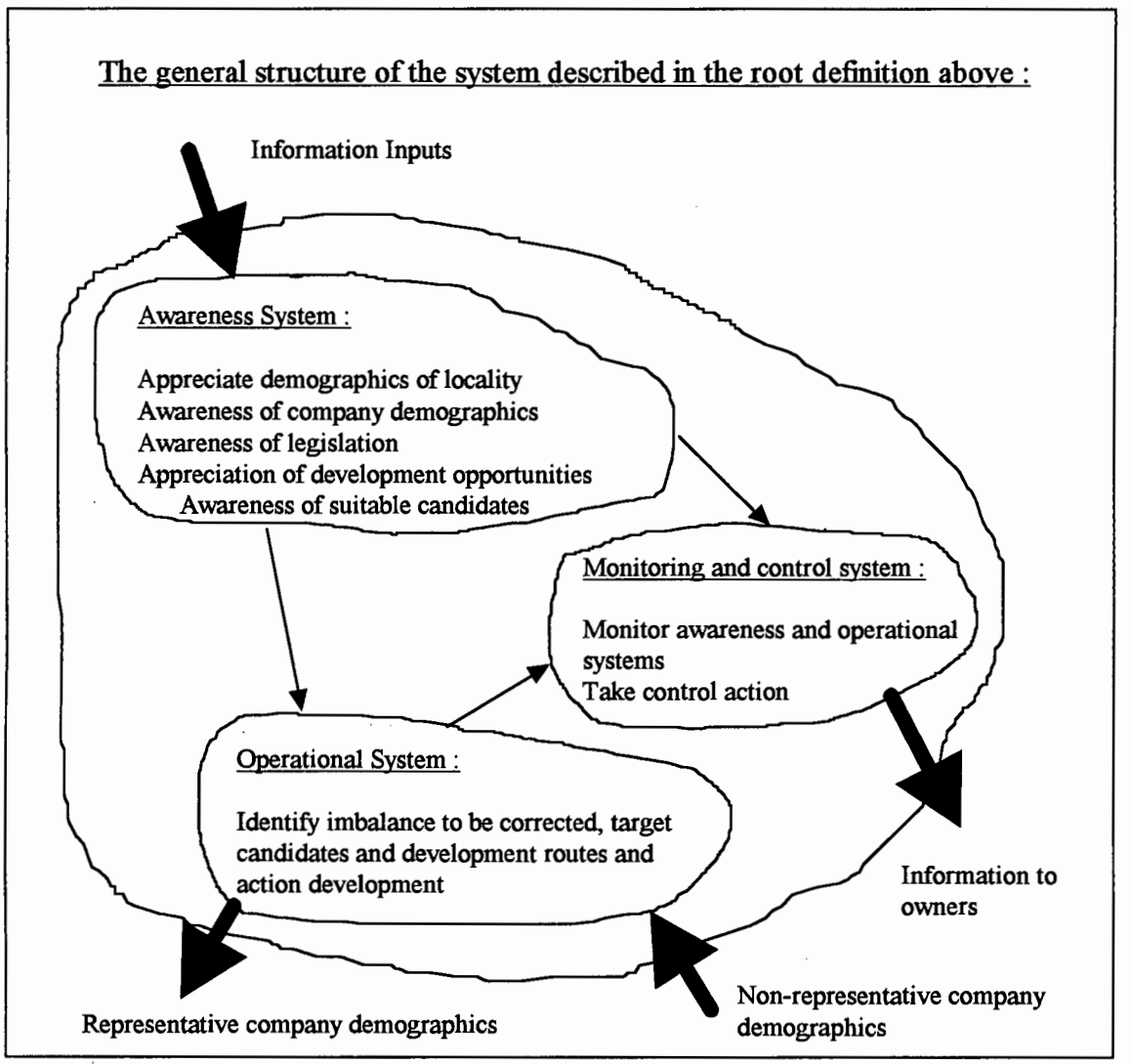
The models for these three definitions are illustrated on the following pages.

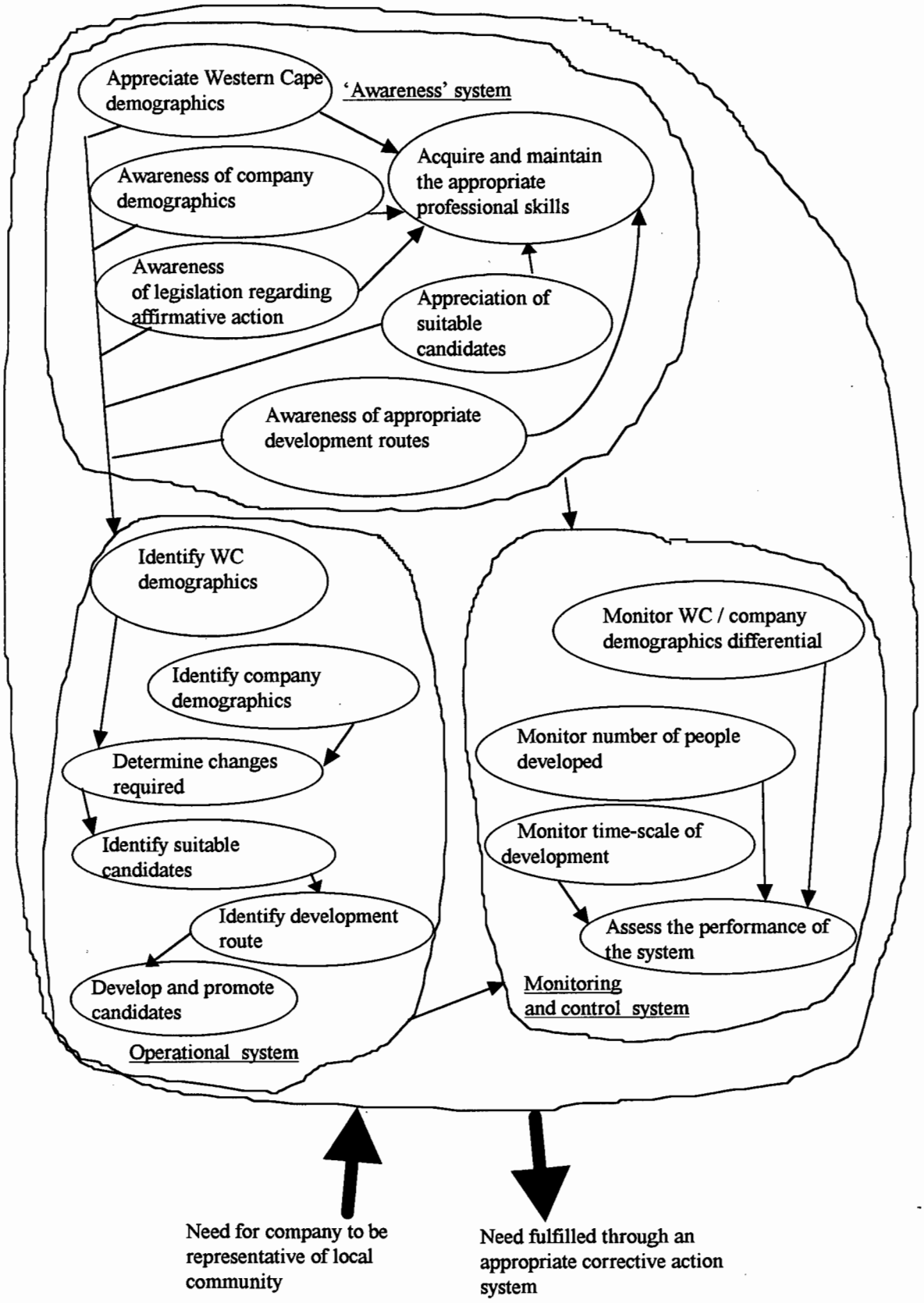
A system to transform the demographics of the company to fit that of the Western Cape

Transformation : Company not representative of Western Cape demographics ⟹ Representative

Additional constraints : Must include entire company structure and must be completed within a time constraint

Beneficiary Hurt	Disadvantaged, non-whites Non Disadvantaged, Organisation
Actors	Top Management, Line Management, Human Resources
Worldview	Legislation, Moral Duty, Equality
Owner	Managing Director, Line Managers, Operators
Environmental constraints	Pool of people, legislation



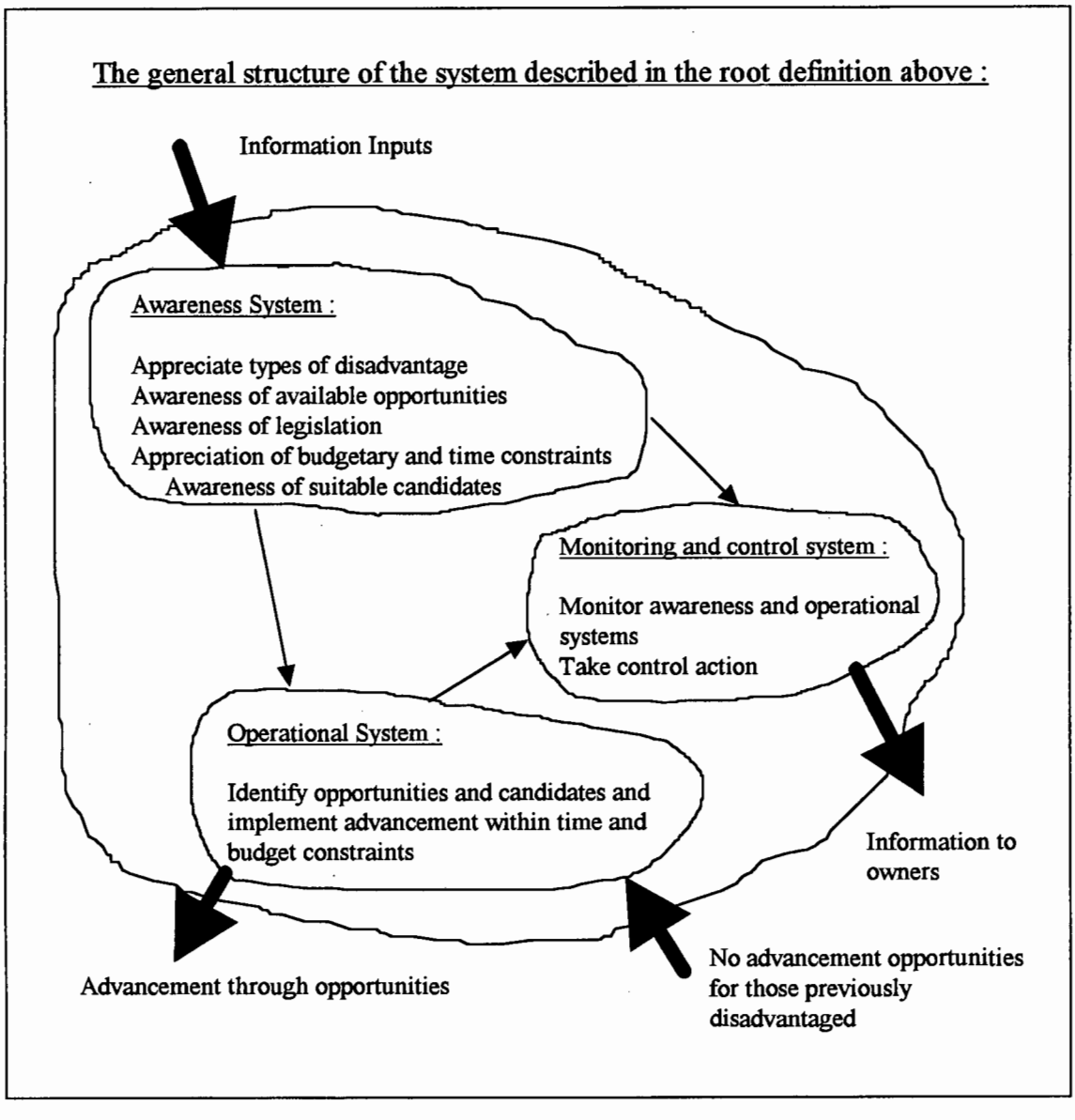

Appreciate Western Cape demographics
'Awareness' system
Acquire and maintain the appropriate professional skills
Awareness of company demographics
Awareness of legislation regarding affirmative action
Appreciation of suitable candidates
Awareness of appropriate development routes
Identify WC demographics
Identify company demographics
Determine changes required
Identify suitable candidates
Identify development route
Develop and promote candidates
Operational system
Monitor WC / company demographics differential
Monitor number of people developed
Monitor time-scale of development
Assess the performance of the system
Monitoring and control system
Need for company to be representative of local community
Need fulfilled through an appropriate corrective action system

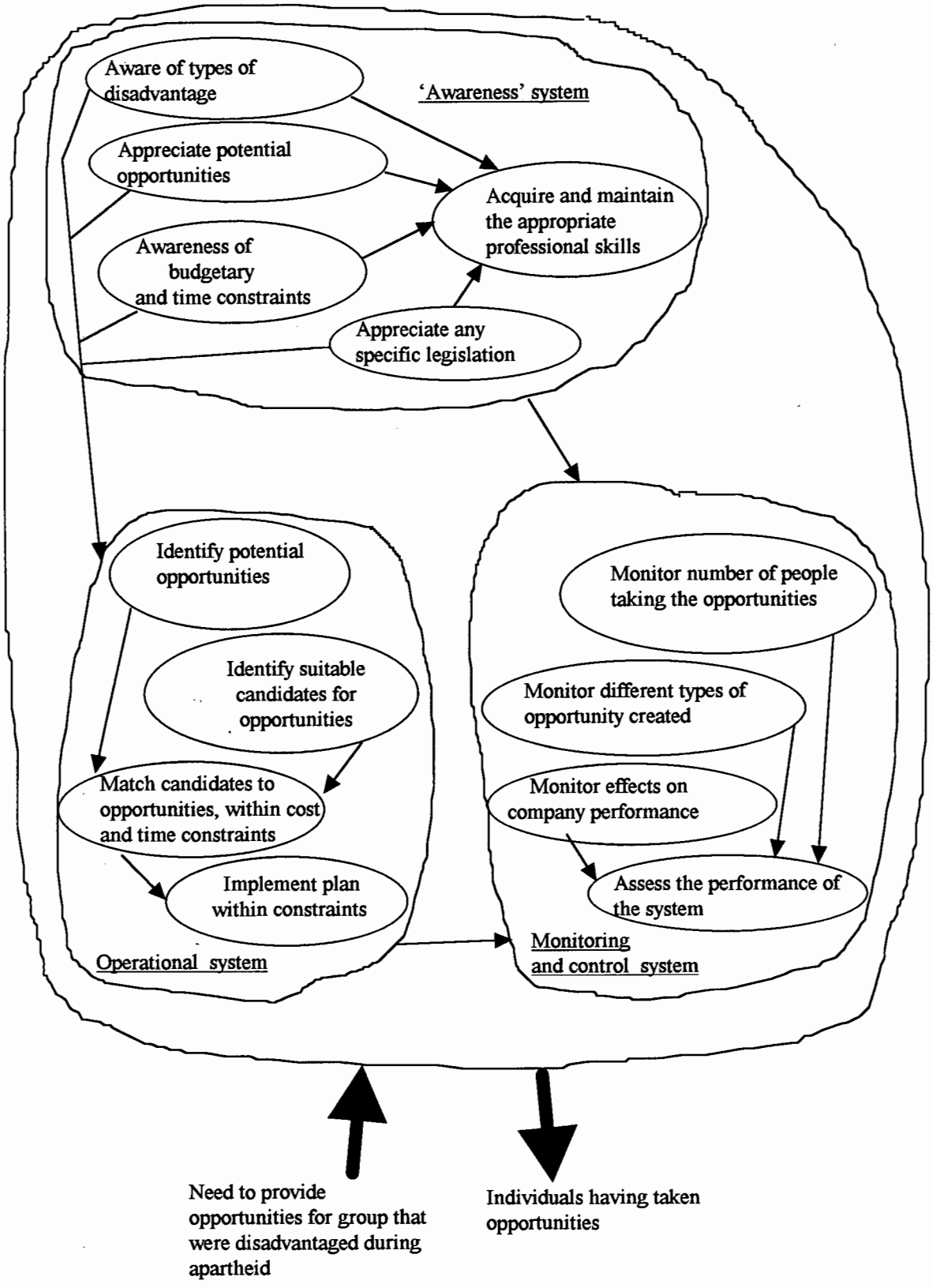
A system to identify and action opportunities for those disadvantaged by apartheid.

Transformation : No Opportunities For Disadvantaged ⇒ Opportunities (within budget)

Definition of disadvantaged : Actual discrimination or generalised discrimination ?

Beneficiary Hurt	Disadvantaged Non Disadvantages, Organisation
Actors	Top Management, Line Management, Human Resources
Worldview	Legislation, Moral Duty, Equality
Owner	Managing Director, Line Managers, Operators
Environmental constraints	Pool of people, legislation

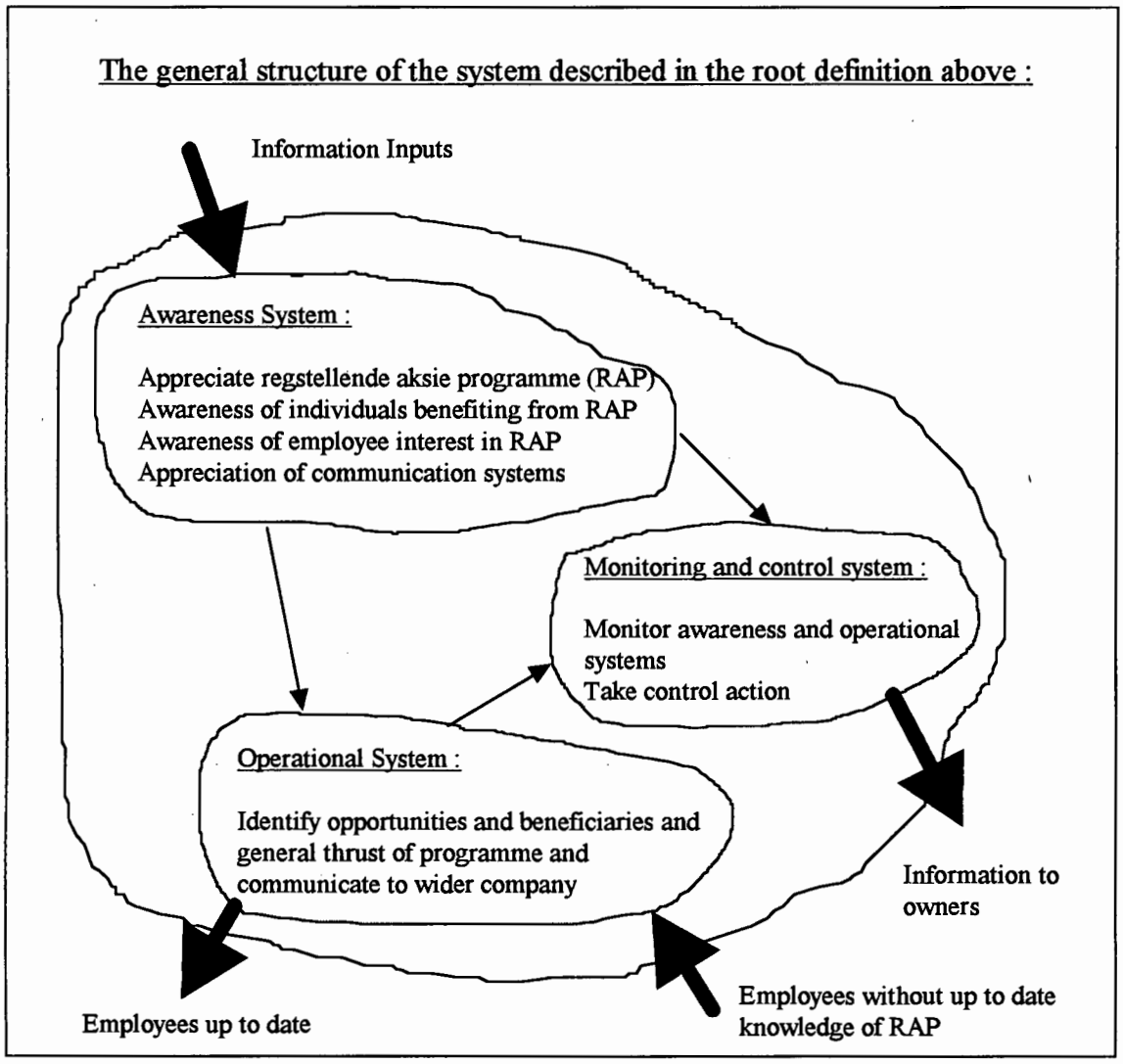


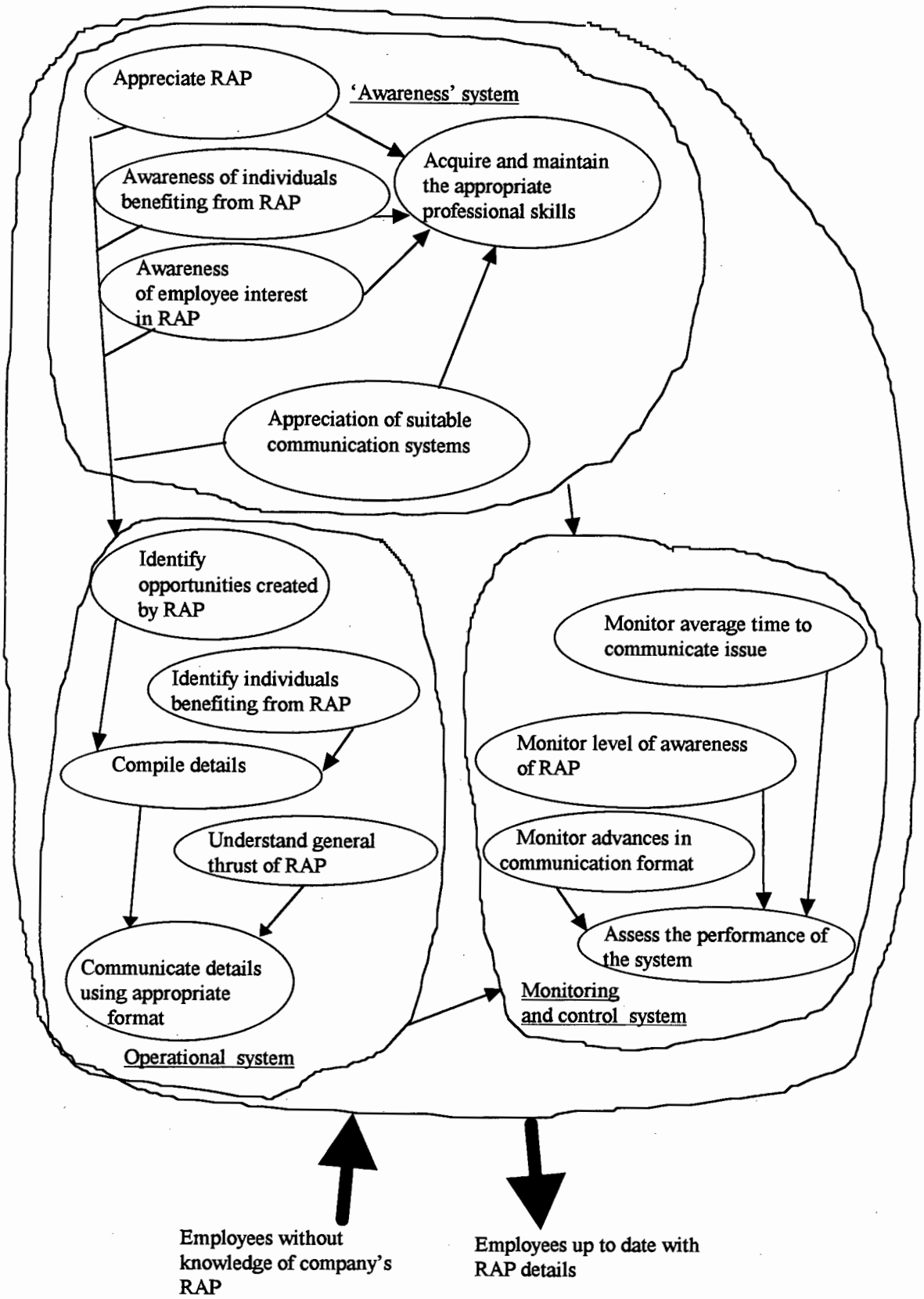

Aware of types of disadvantage
'Awareness' system
Appreciate potential opportunities
Acquire and maintain the appropriate professional skills
Awareness of budgetary and time constraints
Appreciate any specific legislation
Identify potential opportunities
Identify suitable candidates for opportunities
Match candidates to opportunities, within cost and time constraints
Implement plan within constraints
Operational system
Monitor number of people taking the opportunities
Monitor different types of opportunity created
Monitor effects on company performance
Assess the performance of the system
Monitoring and control system
Need to provide opportunities for group that were disadvantaged during apartheid
Individuals having taken opportunities

A system to inform employees about regstellende aksie, the available opportunities and those who have taken opportunities.

Transformation :	Uneducated about affirmative action	⇨	Educated and in touch (communication of actuality of AA at Company XYZ)

Beneficiary Hurt	Disadvantaged, company Non-Disadvantaged
Actors	HR who then educate line managers, but continue with core communication
Worldview	Important to know about intervention
Owner	Managing Director, Operators (? - depends on method of communication)
Environmental constraints	Time, Communication Systems




Appreciate RAP
'Awareness' system
Awareness of individuals benefiting from RAP
Acquire and maintain the appropriate professional skills
Awareness of employee interest in RAP
Appreciation of suitable communication systems
Identify opportunities created by RAP
Identify individuals benefiting from RAP
Compile details
Understand general thrust of RAP
Communicate details using appropriate format
Operational system
Monitor average time to communicate issue
Monitor level of awareness of RAP
Monitor advances in communication format
Assess the performance of the system
Monitoring and control system
Employees without knowledge of company's RAP
Employees up to date with RAP details

Within the company the initiatives would again be wider than the accepted affirmative action programmes.

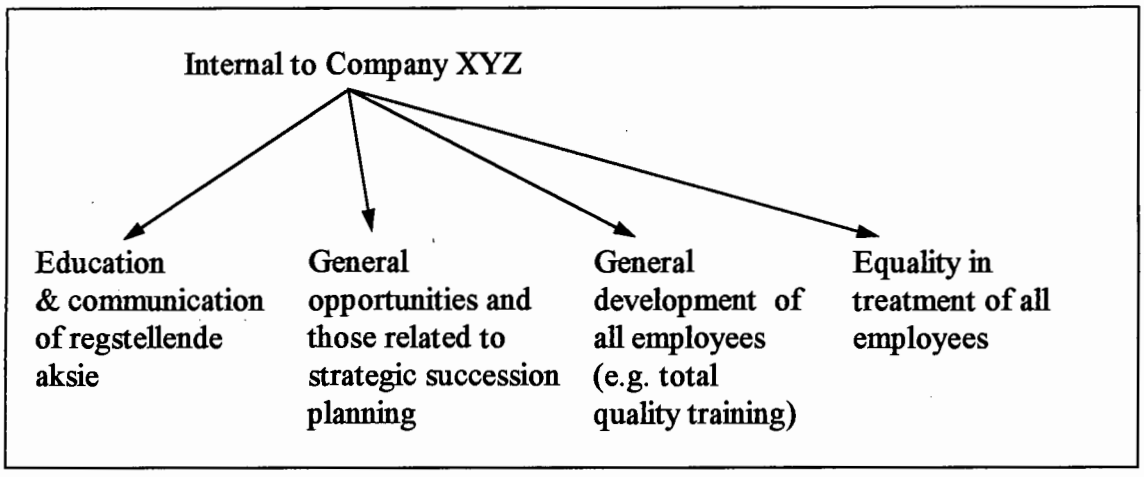


Figure 42 - *Regstellende aksie* within the company

In summary, the modelling and discussion of the regstellende aksie programme helped to crystallise the thinking on a difficult and politically sensitive issue which had not been rigorously considered. The modelling helped Group 1 think through exactly what would be involved in the three specific aspects of the programme. It was clear at the end of the modelling process that it would be advantageous to continue the discussions and construct a solid framework for the programme.

2.4.7. The Union Perspective

Although not a central theme emerging from the interviews, unions are playing an increasing role in the new South Africa and have gained significant political power in the past 15 years. In trilateral negotiations, the unions, management and the government have agreed on a new Labour Relations Act which will have significant implications for business, both now and in the long term. It was agreed to explore the Union's perspective on these issues to facilitate understanding of its position and the company's possible responses. The main sources of information were the interview with a representative from the Union and the HR department's assessment of the new legislation.

The thrust of the new legislation was seen as the movement towards legislated joint decision making (both from the perspective of the Union and the Management). It was agreed that this aspect should be explored using the SSM process. The positions of the three parties are shown in Figure 43.

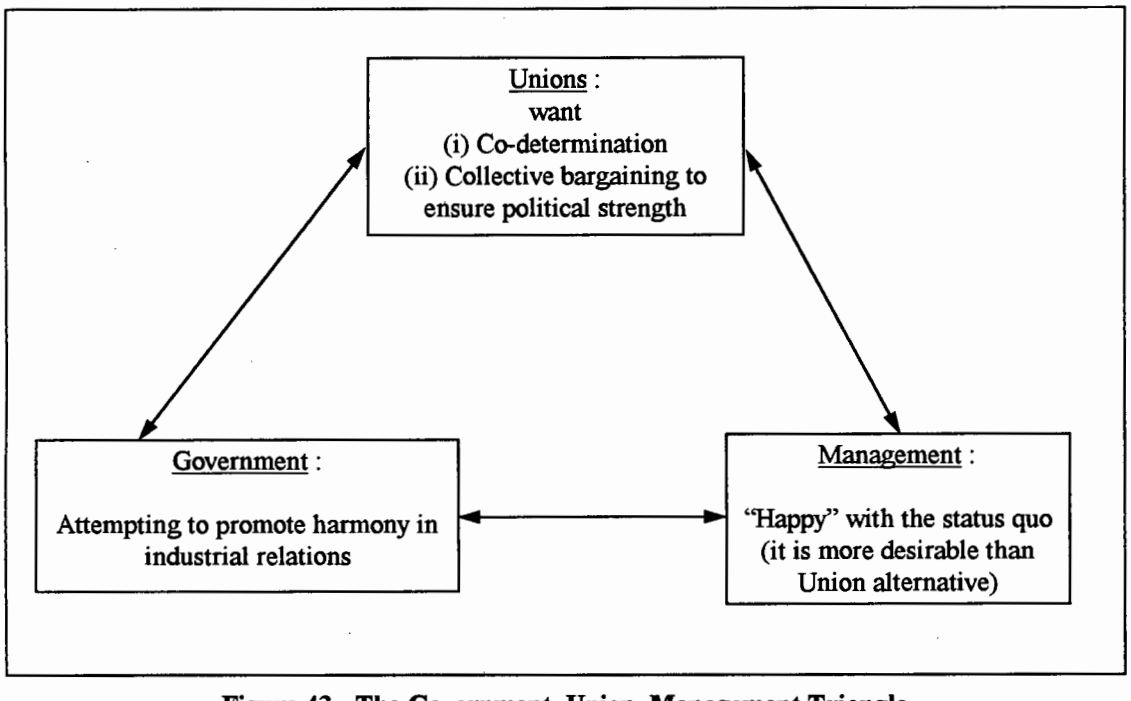


Figure 43 - The Government, Union, Management Triangle

COSATU[ff] has adopted 'strategic unionism' [59] as their modus operandi and have defined degrees of participation as follows :

Table 8 - COSATU Definitions of the Degrees of Participation

Degree of participation	*Description*
Pseudo-participation	Question or discuss issues with no influence on final decision
Partial-participation	Influence on decisions, but management have final say
Full-participation	Full ability jointly to decide.

Two definitions had been constructed by the author before the definitions by COSATU were found. The two already chosen were : consultative co-determination and democratic co-determination (see Table 9). Fortunately consultative co-determination would fit partial-participation and democratic co-determination - full-participation. The authors definitions were used in the modelling phase.

Table 9 - Definitions of Participation used for Modelling

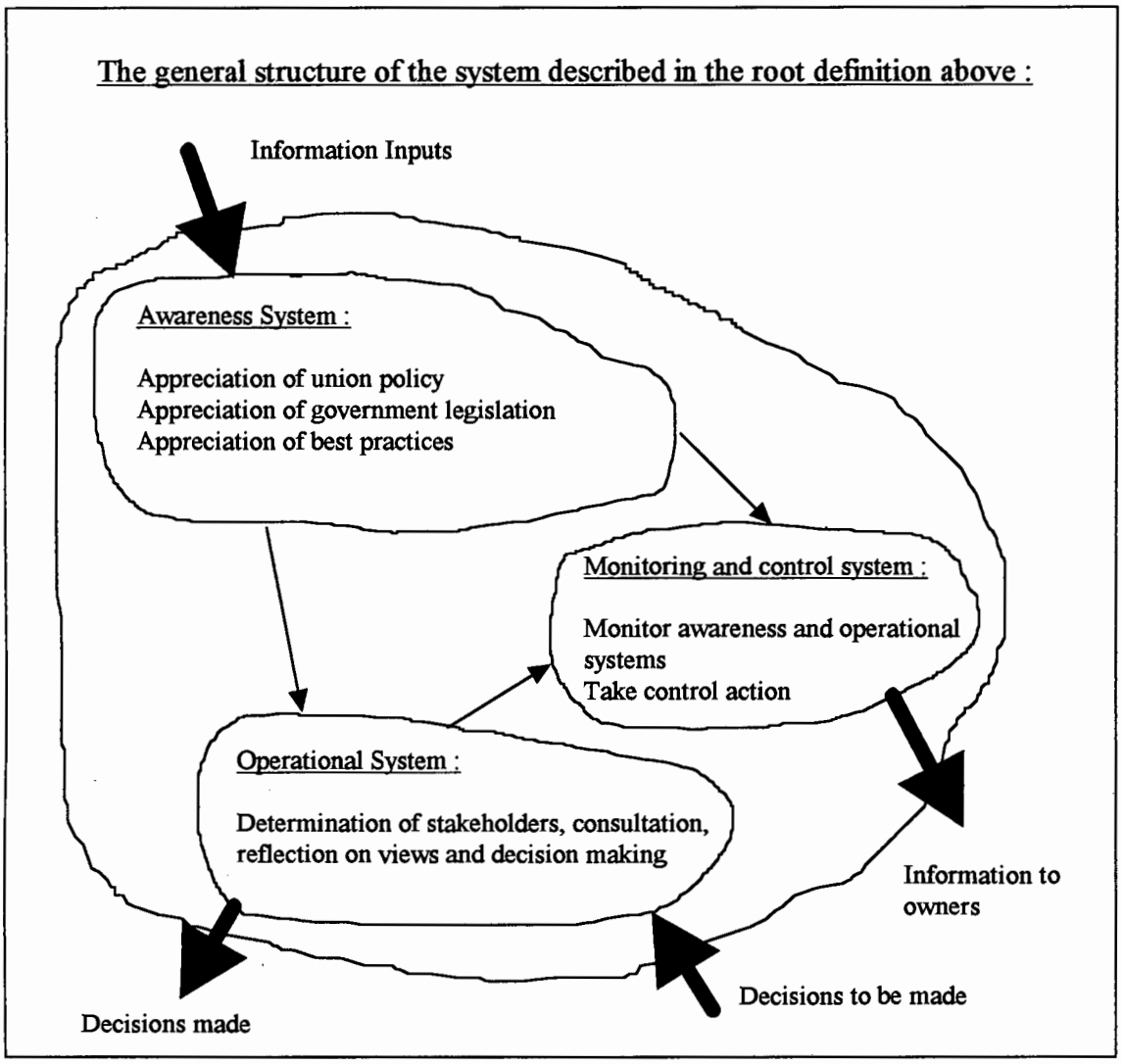
No.	*Label*	*Definition*
1	Consultative co-determination	A system to consult stakeholders on specific issues and allow reflection on the different views before a management decision is made on the issue.
2	Democratic co-determination	A system to consult stakeholders on specific issues and allow reflection on the different views before a democratic decision is made on the issue.

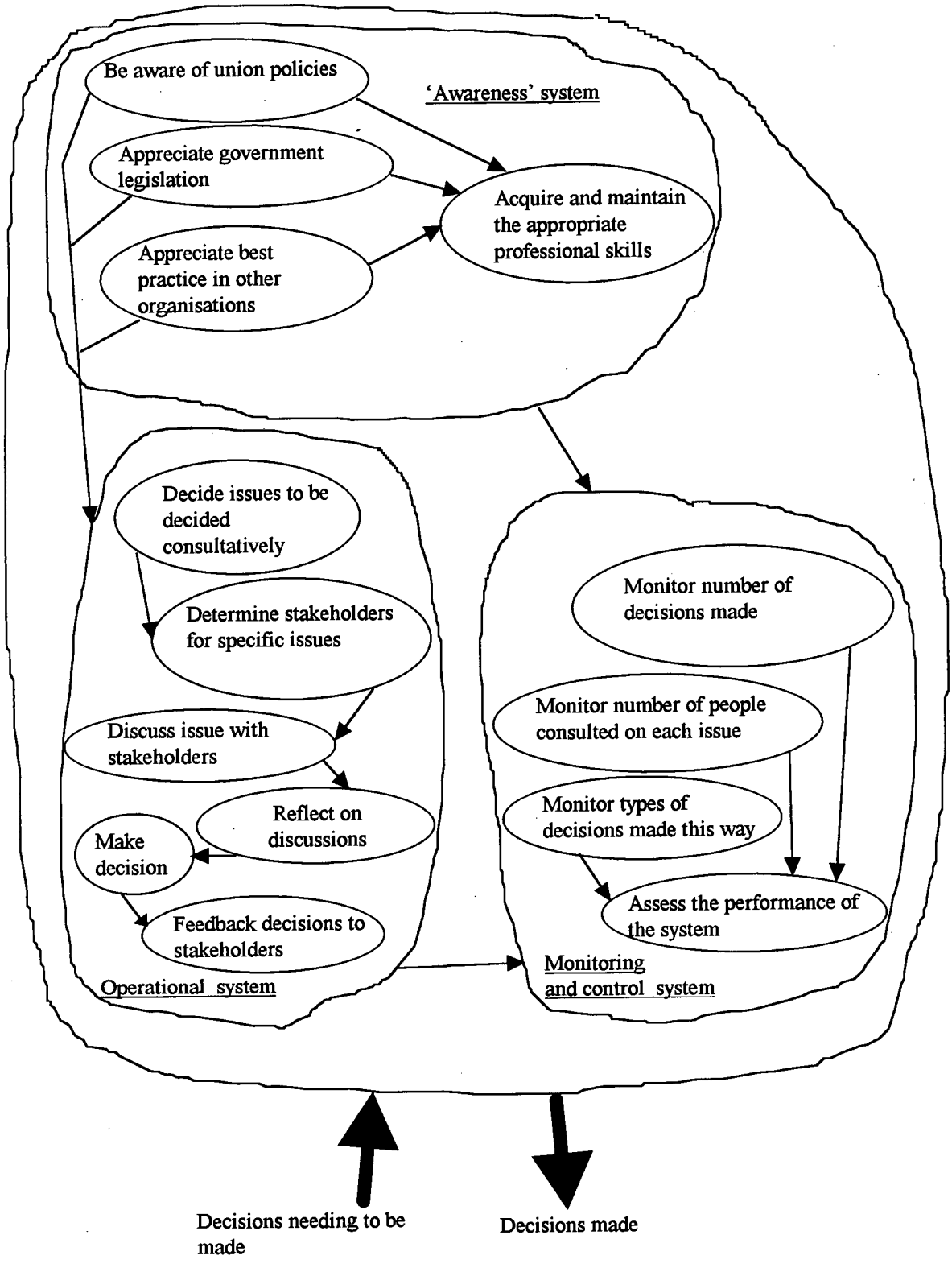
[ff] COSATU- the Congress of South African Trade Unions.

Definition *A system to transform current autocratic management decision making into a **consultative** process*

Transformation : Management making all decisions autocratically ⟹ A consultative decision making process

Beneficiary Hurt	Stakeholders, company Managers
Actors	Stakeholders
Worldview	Consultative decision making is better as it deliberately surfaces divergent views on specific issues
Owner	Management ? Legislation
Environmental constraints	A basic understanding of the issues



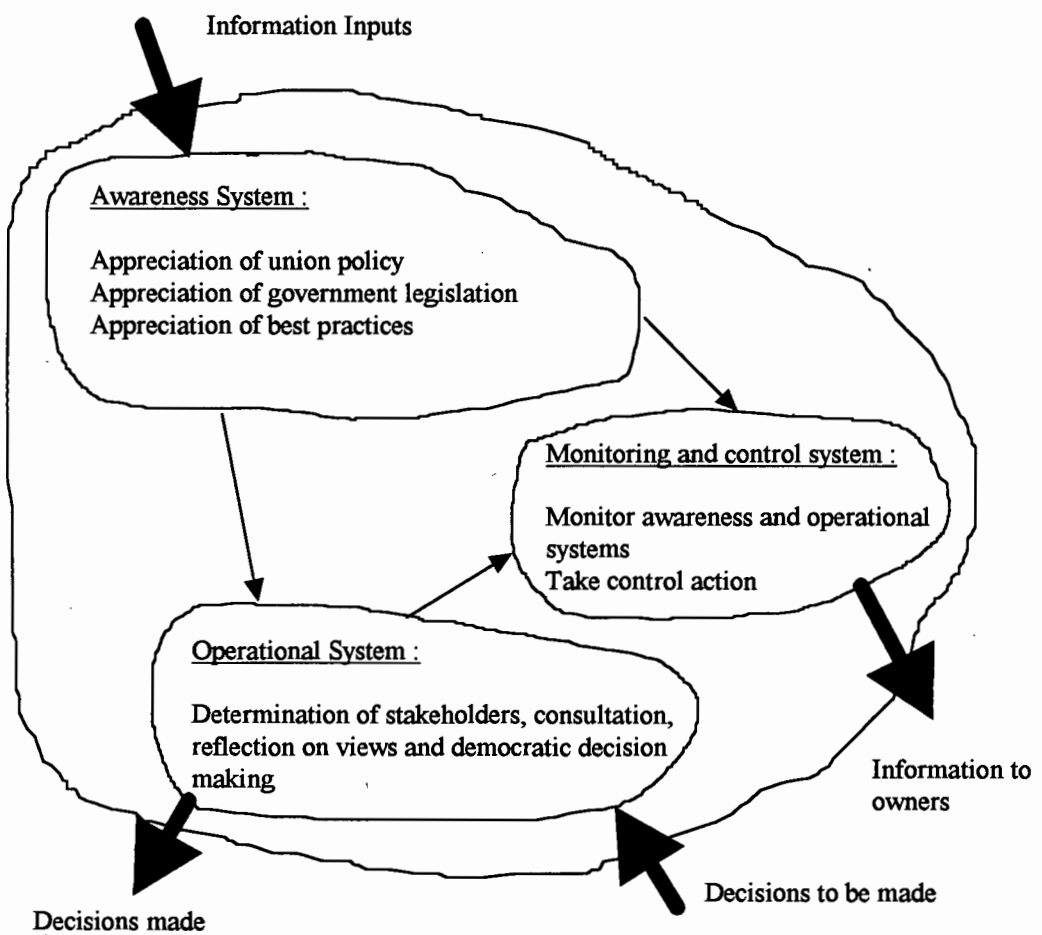

Be aware of union policies
'Awareness' system
Appreciate government legislation
Acquire and maintain the appropriate professional skills
Appreciate best practice in other organisations
Decide issues to be decided consultatively
Determine stakeholders for specific issues
Discuss issue with stakeholders
Reflect on discussions
Make decision
Feedback decisions to stakeholders
Operational system
Monitor number of decisions made
Monitor number of people consulted on each issue
Monitor types of decisions made this way
Assess the performance of the system
Monitoring and control system
Decisions needing to be made
Decisions made

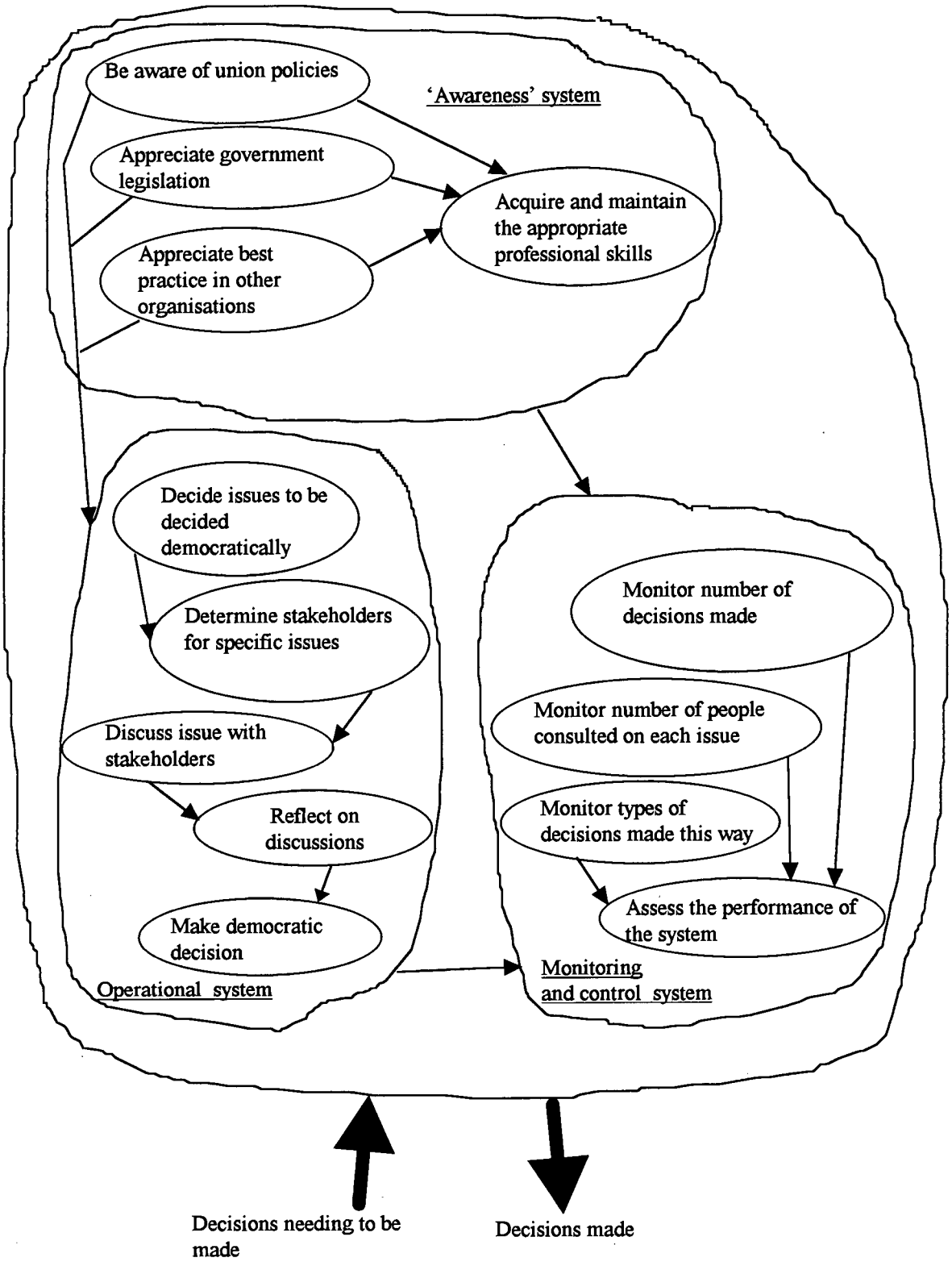
Definition *A system to transform current autocratic management decision making into a **democratic** process*

Transformation : Management making all decisions autocratically ⟹ A democratic decision making process

Beneficiary Hurt	Stakeholders, company Managers
Actors	Stakeholders
Worldview	Democratic decision is the fairest way to make decisions as those affected by the decision make the decision
Owner	Management ? Legislation
Environmental constraints	A basic understanding of the issues

The general structure of the system described in the root definition above :




Be aware of union policies
'Awareness' system
Appreciate government legislation
Acquire and maintain the appropriate professional skills
Appreciate best practice in other organisations
Decide issues to be decided democratically
Determine stakeholders for specific issues
Discuss issue with stakeholders
Reflect on discussions
Make democratic decision
Operational system
Monitor number of decisions made
Monitor number of people consulted on each issue
Monitor types of decisions made this way
Assess the performance of the system
Monitoring and control system
Decisions needing to be made
Decisions made

Following the modelling, the COSATU definitions were used in a different way. Management was asked on which decisions they should be consulted and on which they would wish not to be involved (given acceptable guidelines and monitoring etc.). This new perspective caused much discussion. The themes that were being discussed were drawing closer to those that had emerged through the discussions on teamwork.

In addition to Group 1's opinions on the degrees of participation, a theoretical source was also discussed. Hoebeke has proposed a model of work-systems [60] where responsibilities are allocated as follows :

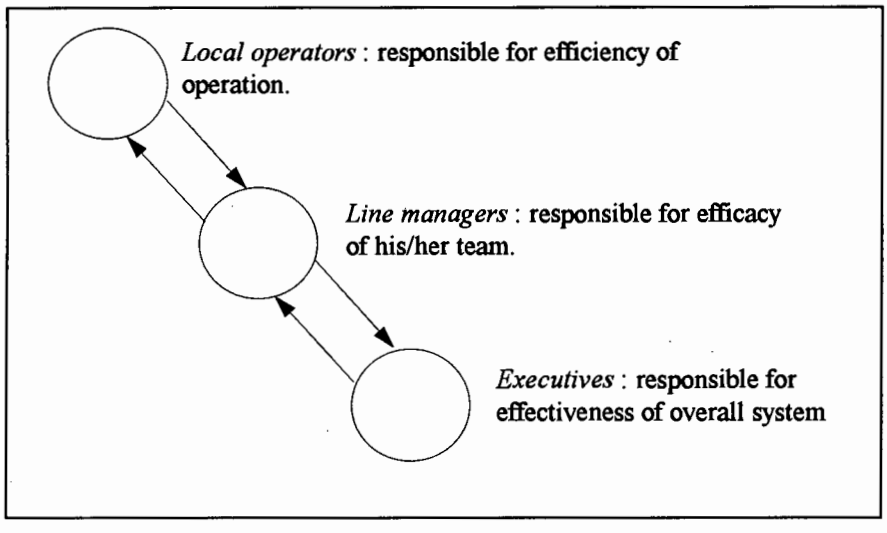


Figure 44 - Measurement of Effectiveness, Efficiency and Efficacy

During the discussions of the union's perspective the debate reiterated the issues that had been expressed when considering teamwork (see Section 2.4.5), namely : what was the company's vision for teamwork throughout the organisation and involvement at the operator level ?

2.5. Stage 5 & 6 : Comparing the Models with Reality & Discussing Changes

Having structured each of the emerging themes in turn, an afternoon session was held to move forward to Stages 5 & 6. Discussions around the models that had been constructed led to the themes evolving once again. Figure 45 illustrates a summary of the changes that occurred. Each will be discussed briefly below.

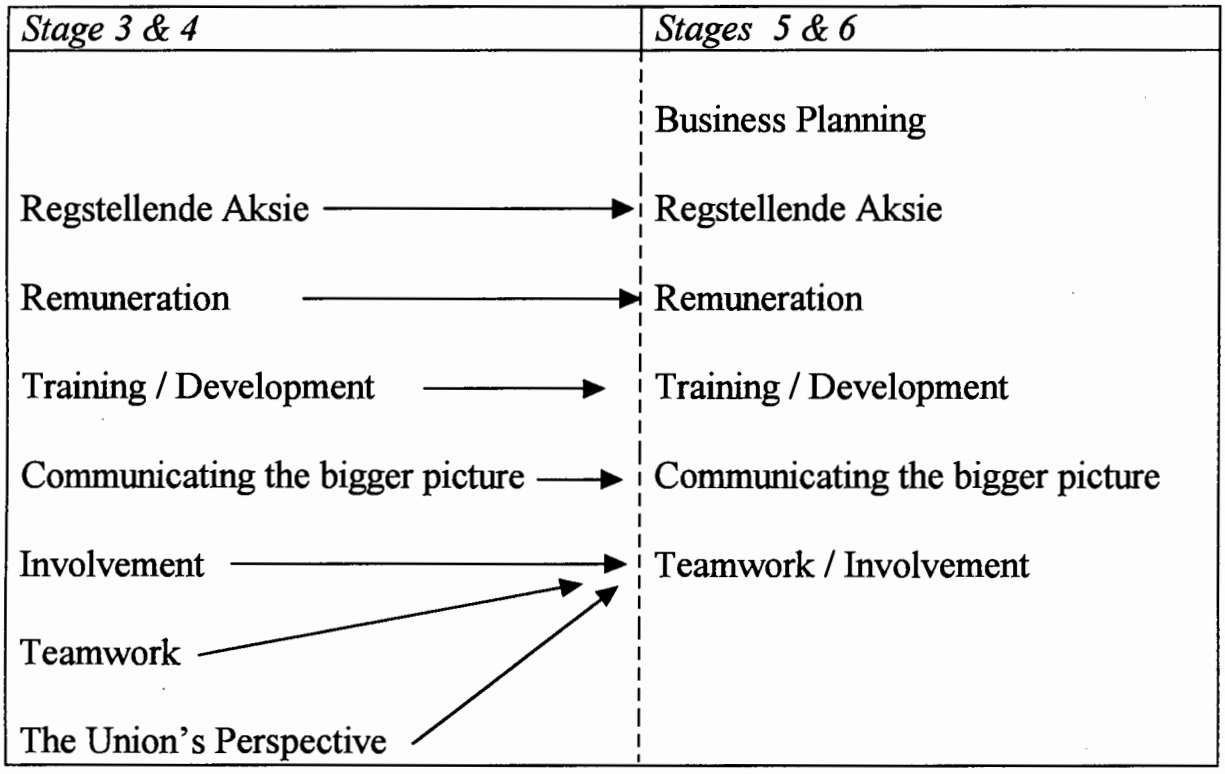


Figure 45 - The Evolution of Themes from Stages 3 & 4 to Stages 5 & 6

Three separate themes (teamwork, involvement and the perspective of the union) integrated into a general discussion of the type of teamwork/involvement that the company actually considered to be suitable. In fact the modelling carried out around the involvement issue turned out to be very similar to that for the Union's perspective. Both led to questions about the type of teamwork, the degree of employee involvement that would be considered ideal and how this goal would be reached.

Another theme that emerged was the concept of business planning. Many of the discussions had implicitly assumed (and indeed required) effective

planning to take place, in order that there was a framework within which the micro activity would fit. (For example training and development was a means to achieve the skills required to fulfil the business plan). It therefore became an important area for action.

Discussions focused on achieving consensus that the issues which had emerged, were indeed those that should be considered important (from the management perspective). The MD had not been present at the Stage 4 discussions and modelling sessions, so the focus was on briefing him and gaining his agreement of the emerging themes. The discussions then re-focused on what actually should be done. Much debate ensued and rather than reconstruct the wandering of the arguments, the results of discussions are presented in the form of remits for projects, which will form the core of the HR2000 implementation programme. (Comments have been included in the footnotes describing the stage the projects had reached by April 1996).

2.5.1. Business Planning[gg]

Team members :	Managing Director, Operations Manager, Group MD, appropriate business planning consultants and process facilitators.
Implementation deadline :	End 1996
Area of concern	The need for the planning to be effective and for different plans to integrate into a cohesive whole. The complexity of the environment makes this planning and integration task more difficult.
Aims of the project :	(i) To investigate and adopt planning processes that are able to deal with the complex environment in which the company operates. (ii) To develop an effective coordination system to ensure that individual plans are self supporting and will integrate with the overall objectives of the company.

[gg] The senior managers spent a weekend in March (1996) discussing short and long term strategic issues.

2.5.2. Remuneration[hh]

Team members :	Managing Director, Operations Manager, Group MD
Implementation deadline :	End 1996
Area of concern :	It has been recognised that the current remuneration system is no longer appropriate. The system has developed over many years and does not link either company performance, individual performance or relevant skills to remuneration levels.
Aims of the project :	To develop a remuneration system that will : (i) encourage the development of skills relevant to the company's business plans (ii) link personal rewards to company performance (iii) enable rewards to be linked to personal performance.

2.5.3. Training and Development[ii]

Team members :	HR Manager, Line Managers
Implementation deadline :	Next business planning cycle
Area of concern :	Whilst training is recognised as an essential feature of the company's drive to attain world class status, the development of training plans has yet to be formalised as part of the planning cycle.
Aims of the project :	To link the objectives of training and development to the needs of the business in the short, medium and long term and to formalise this procedure as part of the business planning process.

[hh] No progress has been made.
[ii] No progress has been made.

2.5.4. Communicating the Bigger Picture[ii]

Team members :	To be decided
Implementation deadline :	30th April 1996
Area of concern	Concerns have been expressed by a cross section of employees that the information available about the performance of the company within a wider context is not easily available. In addition there is concern about the level of conceptual understanding of the 'bigger picture' issues.
Aims of the project :	To develop a communication system that will convey 'the bigger picture' to all company employees, having ensured that they can understand and interpret the information.

2.5.5. Regstellende Aksie[kk]

Team members :	HR Manager
Implementation deadline :	31st June 1996
Area of concern	*Regstellende aksie* (RA) is an issue at all levels within industry. Whilst the objectives of RA are clear and largely considered reasonable, the strategies to achieve a representative workforce are wide and varied.
Aims of the project :	To clarify its approach and adopt an RA strategy acceptable to most stakeholders and implement the objectives.

[ii] An existing communication forum, the quality stage, originally the domain of only quality related issues is now being use to communicate more general issues. An agenda has been developed which ensures each area manager addresses the meeting on a regular basis. Financial performance information is also included.

[kk] As an initial step, all employees have been offered the opportunity to complete their secondary education (1st quarter 1996). The fees will be sponsored by the company. 15 individuals have taken up this offer. Regstellende aksie now also has a specific budget. In addition ten 'fast-trackers' have been identified through discussions with managers and a series of interviews with the candidates. These people will receive accelerated development to fill key positions that have been identified.

2.5.6. Teamwork and Involvement[11]

Team members :	Line Managers, Operations Manager, Facilitator
Implementation deadline :	31st June 1996
Area of concern	The company has used teams effectively to pursue the goals of total quality. As with all processes however a transition stage has been reached where the aims and objectives of teamwork must be re-evaluated, consolidated and improved.
Aims of the project :	To identify the criteria for successful teamwork and assess the benefits so far. Having evaluated the criteria for success, the teams within the factory must each be examined, evaluated for their performance and plans made to improve the teamwork and results achieved by the teams. NOTE: This project will use SSM and will be facilitated by one of the HR2000 committee.

2.5.7. Immediately Implementable Suggestions

A number of good ideas emerged from the interviews that can be readily implemented. They are recorded for discussion and action.

[11] The project is well underway, having been initiated in February 1996. The managers meet every two weeks. A code of conduct has been agreed. Each manager has completed 6 interviews (part of stage 1 of the SSM process).

Table 10 - Immediately Implementable Suggestions

Suggestion	*Description*
Product identification	Customers use their own label on the fabric sold to them. Samples of the end garments should be displayed to highlight the shops that are selling them.
Housekeeping	In some areas vents and lighting require maintenance/improvement
Improved morning meetings	Holding the morning meetings in Afrikaans may improve participation as for some operators English is their second language.
Quality Stage Information	As not everyone is able to attend the weekly 'quality stage', minutes could be taken and be put up in the team areas.
Group Tenets	Publishing and discussing the Group tenets may lead to the adoption of a useful code of conduct for all employees.
Tools for the job	An audit and replacement procedure for tools could ensure a complete set of tools is available for jobs.
More equal treatment	To reduce claims of inequality there should no favouritism - e.g. overtime rules should not be broken at any time.
PC use	A project to streamline the data entry and processing cycle could avoid duplication of effort.
Training modules	Training modules are in place and training should start as soon as possible (Dye House ?).
Local productivity measurement	The knitting department has recently instituted a system to record the productivity of individual operators. This could be extended to other departments.
Quick changeovers	Reducing the set-up time of equipment may be increasingly worthwhile and lead to productivity increases if the tendency to small batches continues.
Customer awareness	"Women don't look at fabric, they feel it". Awareness of the requirements of the customer will help focus on fulfilling their needs. Techniques such as QFD (quality function deployment) could be used.
Key functions	There are critical jobs for which the skills or experience may not be readily available locally. These jobs should be identified and plans made to safeguard the valuable skills.
Best work methods	There are a number of different ways of doing the same job. Discussions about methods would lead to an area adopting best practice methods.

2.6. Stage 7 : Taking Action

In Stage 6, a series of interventions were detailed which will form the core projects of the HR2000 programme. Whilst the actions to be taken have been defined, the duration and scope of the project does not allow for the author to be present whilst the changes are implemented. This, the last section in this chapter, will describe the actions that have been taken to continue the project and to test inductively, in so far as is possible without implementation, that the recommendations for action are both desirable and acceptable.

The following sections will consider four areas :

- the feedback session that was held to Group 2 back into the project.
- a systems dynamics model will be constructed to expose the expected dynamics of the interventions.
- an attempt will be made to synthesise the project
- the way that the Company proposes to continue the interventions will be detailed.

2.6.1. Feedback to the Wider HR2000 Committee

As has been described in Section 2.1, two groups had been established. Group 1 had been involved through-out the process and were, thus, very familiar with the issues that had surfaced. Group 2 had only been exposed to the initial proposal for the project and an introduction to SSM as a process of enquiry.

One of the crucial elements of the project was therefore, firstly, to acquaint the wider group with the detail of the project and, secondly, to initiate a discussion of the issues and models, with the focus on achieving consensus on the actions that should be taken. There follows a description of the afternoon session that was held to feedback the details of the project.

The session was divided into two parts : the first was structured to attempt to accelerate the wider group through Stages 1 & 2 of SSM and see if the emerging themes from a group session were representative of the findings of the project. Secondly, the detail of the HR2000 Programme was fed back and discussed with Group 2.

Instead of simply presenting the findings to Group 2, it was felt that an opportunity existed to test the findings. The first two hours were spent as follows : The managers were asked to consider, individually, the following questions :

(i) what is your vision for the company,
(ii) what will need to be done to reach your vision,
(iii) what immediate concerns need to be addressed within the organisation ?

The managers spent ten minutes considering the questions individually, followed by half an hour in groups of two or three. The object of the group work was to consolidate the main points that were considered key and to prepare to present the ideas to the other groups.

Before the presentations, the groups were asked to listen for common themes and interesting perspectives from the presentations, and to identify the recurring areas of concern. (It should also be noted that no one from Group 1 took part in these discussions and, in the debate phase that followed, the author specifically attempted not to introduce ideas from the Group 1 discussions and also attempted to ensure that there was consensus before recording a theme.) Table 11 was agreed to be a summary of the themes that emerged.

Table 11 - Themes Emerging from the Group 2 Feedback Session

Label	*Description*
World Class Manufacturer (WCM)	Acknowledgement that in order for the company to survive, it will need to become a WCM
Training is a problem	The need for training to increase employee skills
Teamwork	Ongoing development of team-working practices
Communication	Needs improving
Empowerment	Operators need empowering to take greater responsibility
Total quality (TQ) / Continuous Improvement	The existing TQ programme should continue
Planning/Vision	A universally agreed and shared vision for the company will help clarify the future direction
Reward / Recognition / 'What is in it for me?'	The problems associated with remuneration need to be considered seriously and appropriate actions taken.

Having identified the themes above, Group 2 were presented with the details of Group 1's project.

Initially SSM was explained, as were the aims of the project and the series of rich pictures (see Appendix 3 : Examples of Rich Pictures) were used to help express the information from the interviews.

The emerging themes (presented in Section 2.3.5), were explained and compared briefly with those that Group 2 had developed (see Table 11). The modelling and discussion process was then detailed, using the training/development and the Union's perspective models as examples. For each theme the modelling and discussion phase and the emergence of the proposed actions were explained to give an understanding of the issue and how it had evolved. The project remits (see Section 2.5), were then presented to Group 2 and discussion started on the details of the projects.

Group 2 had no major objections to the planned projects which seemed sensible and needed to them. After the discussions with Group 2, a comparison was made with the issues dealt with by Group 1. The comparison is presented in Table 12 - A Comparison of the Themes.

Table 12 - A Comparison of the Themes

Group 1 *Stage 6 Themes*	***Group 2*** ***Themes***	*Group 1* *Stage 2 Themes*
	World Class Manufacturer (WCM)	
Regstellende Aksie		Affirmative action
Training / Development	**Training is a problem**	Training and development
Teamwork / Involvement	**Teamwork**	
	Communication	Communication
Communicating the bigger picture	**Empowerment**	The Union Perspective
	Total quality / Continuous Improvement	
Business Planning	**Planning/Vision**	
Remuneration	**Reward/Recognition/ 'What is in it for me?'**	Remuneration

The table indicates that Group 2 discussed all the issues covered by Group 1 other than affirmative action. The Group 2 discussions included two additional themes, WCM and Total quality / Continuous Improvement, which were not dealt with in Group 1.

2.6.2. Inductively Testing the Proposed Changes

The proposed interventions, described in Section 2.5, which form the core of the output of this project, will form the basis of the HR2000 programme. The programme will be implemented over the next year or so, an assessment of the success or otherwise of the interventions is beyond the scope of this dissertation.

In order to start the inductive process of establishing whether the proposed interventions will have the desired effect, a systems dynamics model was developed to make explicit the expected dynamics resulting from the interventions.

Initially the complexity of the situation was illustrated by showing that the six main themes were all interconnected. An arrow from one theme to another denotes a definite connection or link.

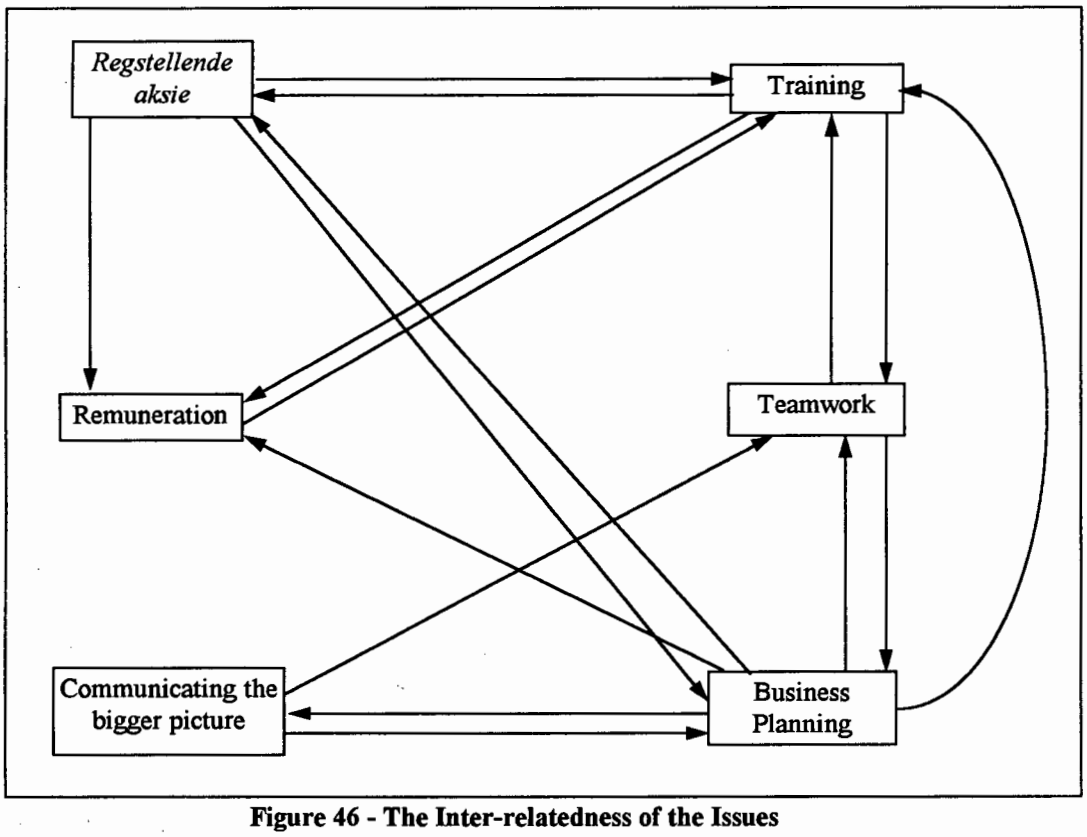


Figure 46 - The Inter-relatedness of the Issues

The complexity of the situation was developed further by integrating the interventions into a cause and effect diagram to explore the expected dynamic interactions of the process. Group 1 spent a morning discussing the dynamic effects that the interventions should and might have.

The initial discussions focused on the predicted consequences of the proposed projects. (That is to say that initially an 'all goes well scenario' was discussed.) The author used the information from these discussions to develop the first systems dynamics model, Figure 47. In developing this model, the group's discussions re-focused on the initial model being incomplete. There were other factors that were not included in the model that might counteract the results desired from the interventions. These other factors are described in the following paragraphs :

The success of the business depends on the ability to adapt plans in an increasingly turbulent and competitive market. The MD has recently introduced a formalised planning process, but the fear is that this may become an annual raindance rather than an evolving process. Critical to the success of business planning will be the evolution of plans to take advantage of the rapidly changing environmental conditions in South Africa. An annual fixed plan will not give the organisation the flexibility to adapt in this way. The traditional approach to planning therefore is not what is required.

The ability to measure performance relative to plans and to be realistic in terms of targets set is also critical. The more traditional planning processes seem inappropriate given the current climate, as the plans will be out of date as soon as they have been finalised. The emphasis must be on finding an appropriate methodological framework for planning, which will make it an evolving process with an appropriate time-scale. Failure to do so may result in the planning process actually being detrimental to company performance.

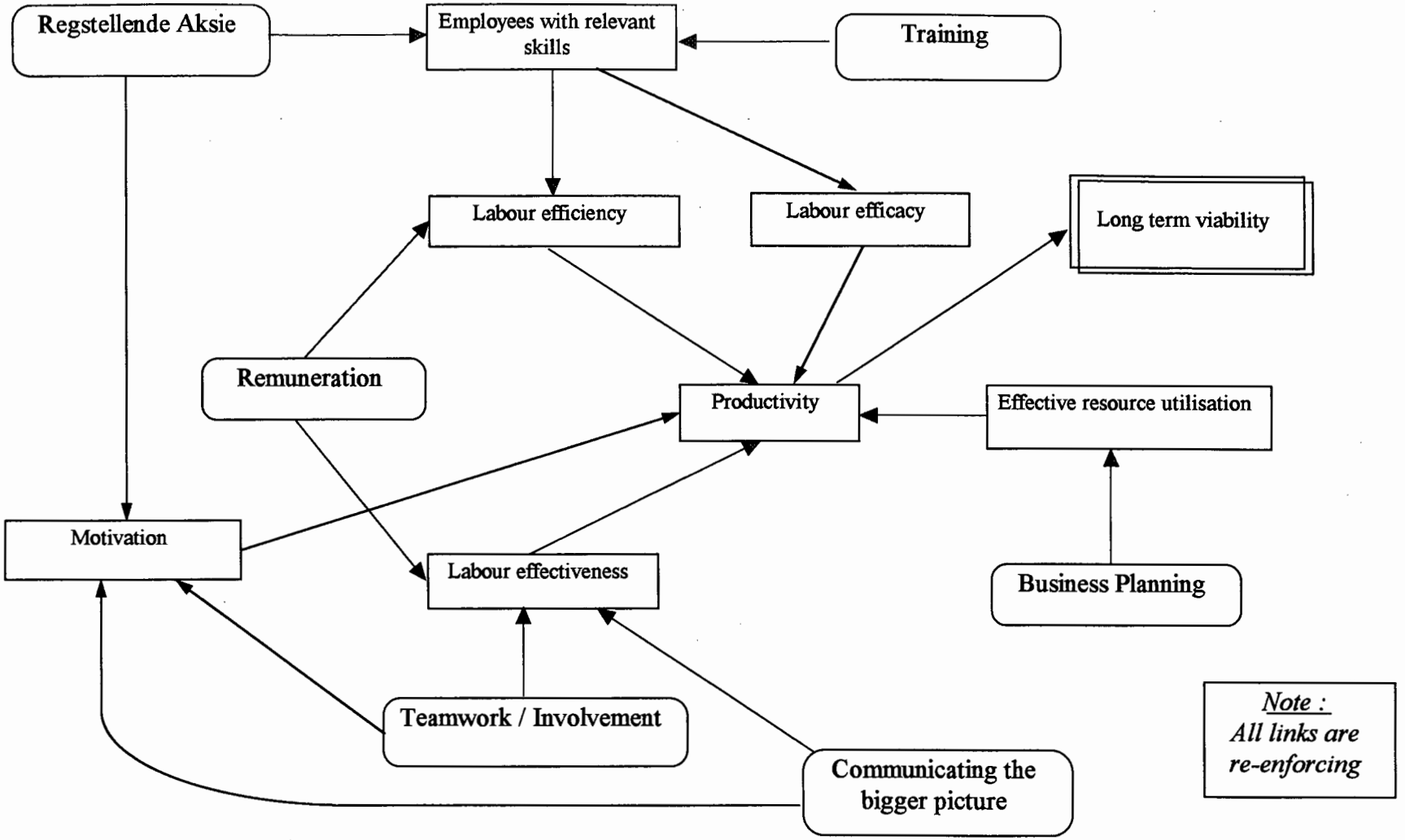


Figure 47 - The Dynamics of the Interventions

Whilst there was consensus that the remuneration system could be improved, any revision would raise contentious issues such as : Will productivity improvement follow from a more focused payment system? Will the union be prepared to negotiate such a system ? Will the skills that command a premium actually be valuable to the company ? Will a new system lead to expectations of pay increases which may not be realised, leading to a consequent lowering of morale ? Remuneration therefore is and will remain a contentious issue. Changing the current system, whilst desired by most stakeholders, may have both positive and negative effects.

Increased training and development has two potential pitfalls: First, the specific targeting of training and development may create expectations, which given a finite budget, may lead to disappointment. Secondly, given that the increased training is successful and leads to the required increase in relevant skills within the organisation, increased employee losses to other companies may result, due to the enhanced marketability of their new skills. These two concerns are expressed in Figure 48 and Figure 49. Both of these projects seemed to have the same potential problem of raising expectations which cannot be met, thereby causing disillusionment and ill-feeling. Open and honest communication about the objectives and resources allocated to both may go some way to keeping expectations within achievable limits.

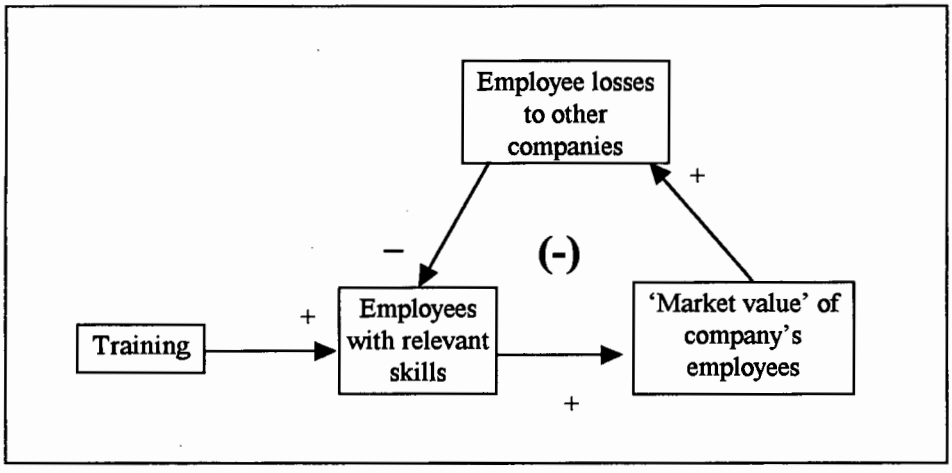


Figure 48 - The Pitfalls of a Training Initiative (1)

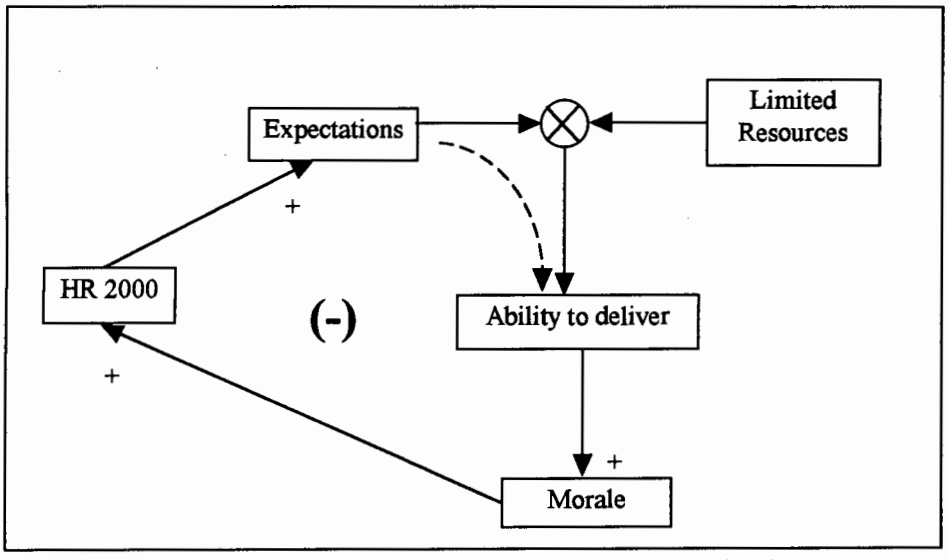


Figure 49 - The Pitfalls of a Training Initiative (2)

The teamwork/involvement initiative is one of the key remits to have emerged from the project. It will involve all manufacturing line managers and has the potential significantly to change the behaviour of all teams within company. Commitment and open and honest communication will be essential to prevent the project being seen as another top management fad.

Using the comments above the author constructed a second, more complex model, shown in Figure 50, which included the balancing effects as well as the original re-enforcing loops. This figure is perhaps too complex, but can be simplified by highlighting the main potential balancing effects. The balancing effects are shown in Figure 51.

In addition to the three balancing loops, illustrated in Figure 51, three other themes emerged from simplifying the figure : (a) All the initiatives would require good leadership, especially teamwork/involvement. Here the commitment and enthusiasm of the line managers would determine the success of the project. (b) The remuneration issue is by far the most politically sensitive and without very good facilitation could easily have a negative effect on the organisation. Case study type research may give the team insight into the pitfalls experienced by other companies. (c)

A planning methodology which is flexible and evolutionary is needed, rather than the more traditional annual planning methods. The former may do more harm than good in an increasingly competitive market place.

The discussions of the dynamics of the interventions heightened Group 1's awareness of where potentially the initiatives may fail. The described are now explicit and can be communicated to the projects teams so that potential areas for failure may be avoided. The main conclusions from the modelling are presented as guidelines for the implementation of the project :

(i) Care must be taken that the HR2000 initiatives do not raise employee expectations to levels where fulfilment will be impossible.

(ii) Skilled facilitation of the initiative will be needed to keep the projects on track and to ensure that they deliver the required improvements.

(iii) Commitment by management will be essential to develop the sense of urgency required to ensure that the proposed projects are implemented within the specified time-scales.

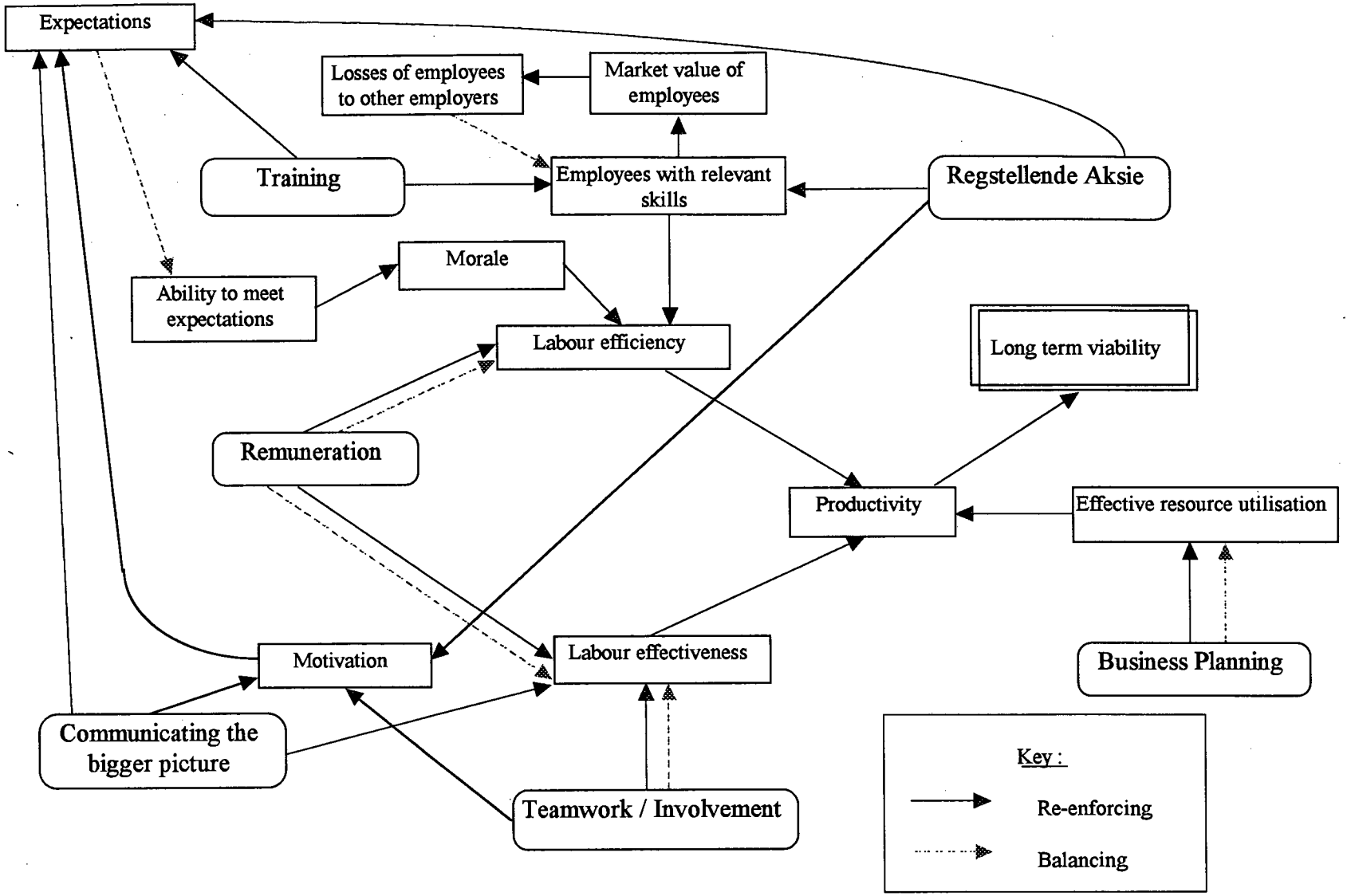


Figure 50 - The Dynamics of the Interventions - A more complex model

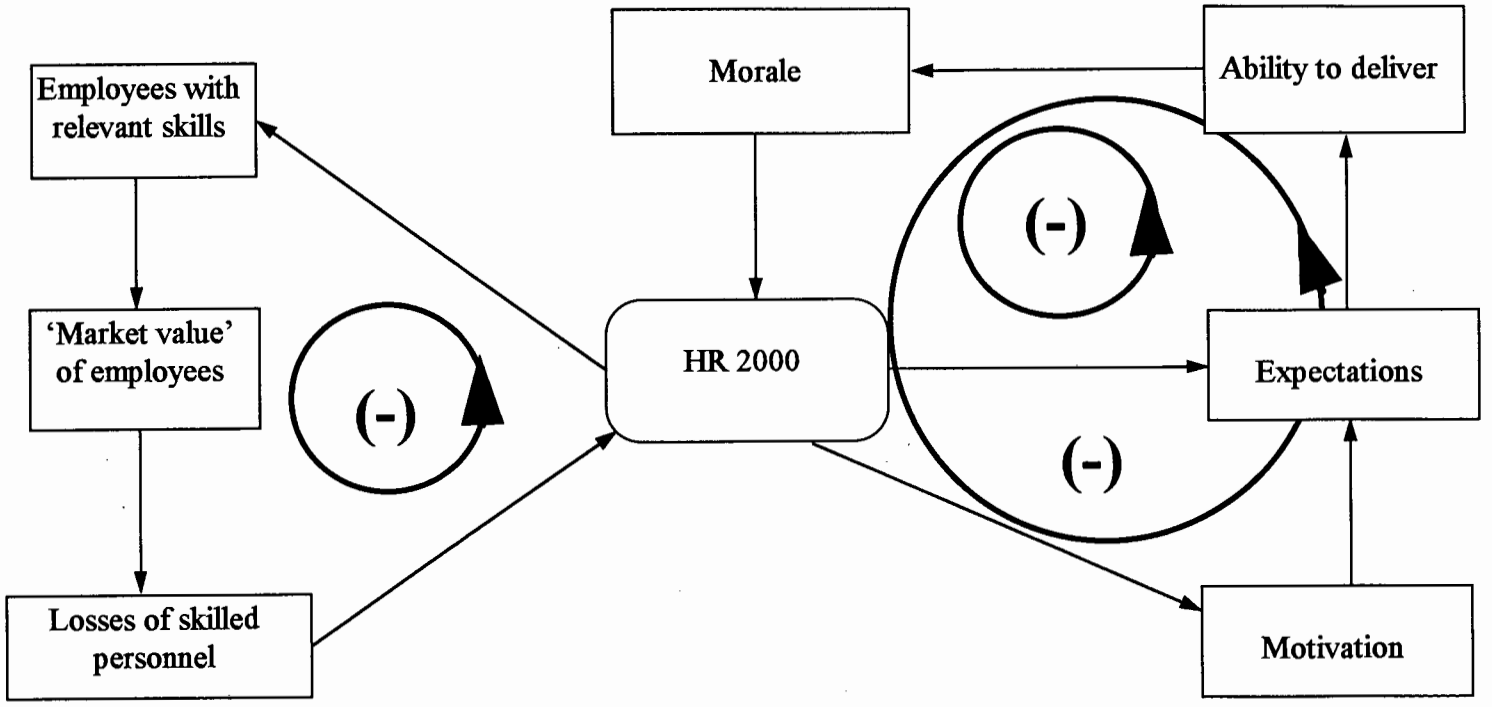


Figure 51 - Potential Balancing Loops

2.6.3. Synthesising the HR2000 Programme

In reflecting on the project, an attempt was made to synthesise the findings into a more cohesive whole. The six projects can be seen to be aimed at different levels within the organisation. The interventions labelled remuneration, training, regstellende aksie and communicating the bigger picture are all targeted at the individual within the organisation. The teamwork/involvement project focuses on attempts to integrate individuals into an effective team. The last project, business planning, draws the efforts of the individuals and teams to the common goal of a successful future. Figure 52, provides a diagrammatic synthesis of the projects.

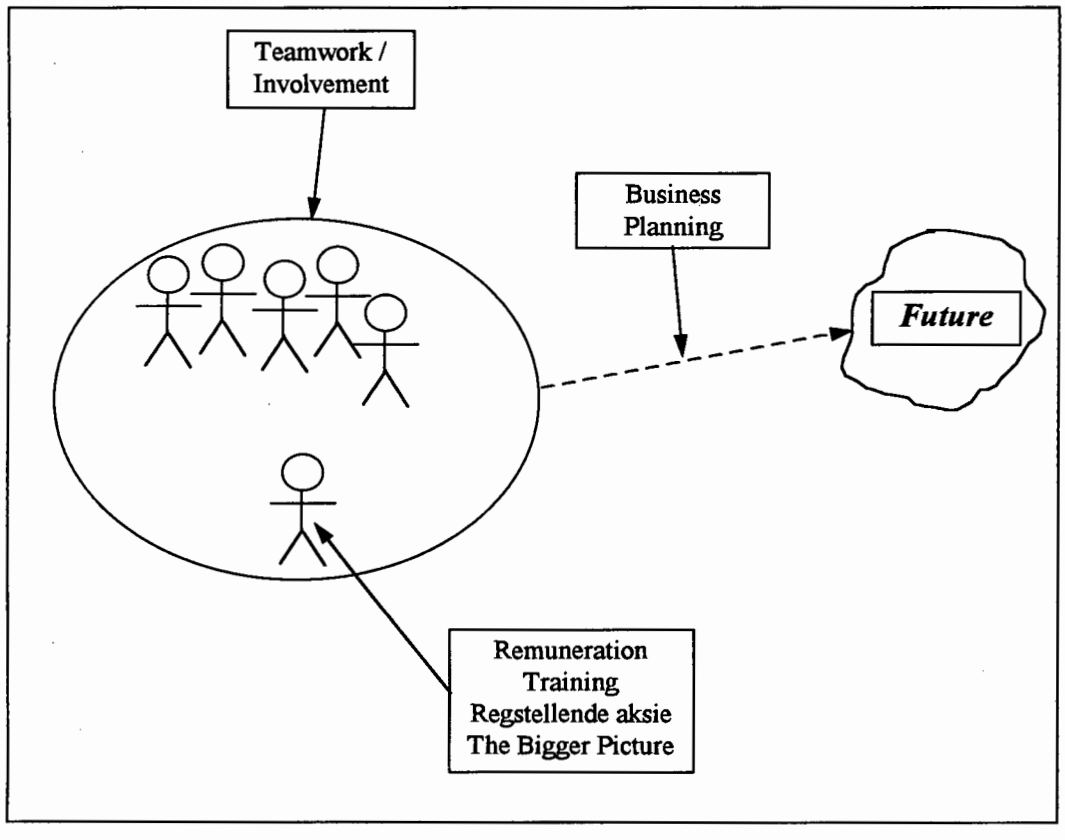


Figure 52 - A Synthesis of the HR2000 Initiatives

2.6.4. Continuing the Project

The final sub-section of this chapter, describes how the results of this project will be used within the Company in the future.

The HR2000 committee has the responsibility to ensure that resources are allocated to the proposed interventions and that they will be carried out to the agreed time scales. In effect, it will be a monitoring and co-ordinating body. A project team will be allocated to each project, given a remit (taken from Section 2.5) and a time schedule for completing the work. The committee will monitor the projects, assessing progress on a monthly basis. The performance of team members will form part of their overall performance assessment.

The company has already committed resources to the HR2000 project. A member of Group 1 will be allocated to the initiative half time. She will become the key facilitator and champion of the HR2000 programme. At the beginning of April 1996, 4 of the 6 projects had been initiated:

The project, 'teamwork/involvement', will use SSM explicitly - the aim being to initiate a learning process through which teamwork will be improved. The line managers will be involved and it is hoped, that through learning about and using SSM, they will, in time, use the methodology in everyday management of their teams. The result should be that the use of SSM for messy problem will be internalised by the company.

The week following the author's feedback to the line managers, Groups 1 and 2 spent an afternoon starting the teamwork/involvement project. Subsequently these meetings have continued every two weeks and the Group has now finished the interviewing process (Stage 1).

As part of 'communicating the bigger picture' project, a video of Nelson Mandela's interview with the SABC[mm] on 'the state of the nation 1996' was shown to all employees. The objective was for all employees to hear, first hand, the competitive realities facing South African industry, especially the textile sector and that the Government would not protect industry from the falling tariffs caused by the GATT[nn] agreement; industry would need to become significantly more competitive to survive. In addition an existing communication forum, the quality stage, originally the domain of only quality related issues is now being use to communicate more general issues. An agenda has been developed which ensures each area manager addresses the meeting on a regular basis. Financial performance information is also included.

The managers had been away for a weekend to discuss short and long term strategic issues, which can be seen as starting the business planning initiative.

For the regstellende aksie project, as an initial step, all employees have been offered the opportunity to complete their secondary education (1st quarter 1996). The fees will be sponsored by the company. 15 individuals have taken up this offer. Regstellende aksie now also has a specific budget. In addition ten 'fast-trackers' have been identified through discussions with managers and a series of interviews with the candidates. These people will receive accelerated development to fill positions that have been identified.

In the longer term, the interventions should address the issues surfaced by the project. It should be noted, however, that other issues will emerge in their place as the situation within the company evolves over time. SSM has been described as a never ending process, so at some time in the future another immersion exercise will need to be completed to ensure that the concerns within the organisation are still understood.

[mm] SABC - South African Broadcasting Corporation

[nn] GATT stands for the general agreement on tariffs and trade.

In an attempt to reflect on what this project has achieved and where it leaves the company in terms of a future direction, Figure 53 was drawn. The picture shows the author arriving from the University to help address some of the current issues and concerns within the organisation. Using SSM as a learning process, the HR2000 programme was developed to address the concerns. The implementation of the programme should allay the specific concerns with which it deals. These, however will recur or be replaced by other issues as the situation develops with time.

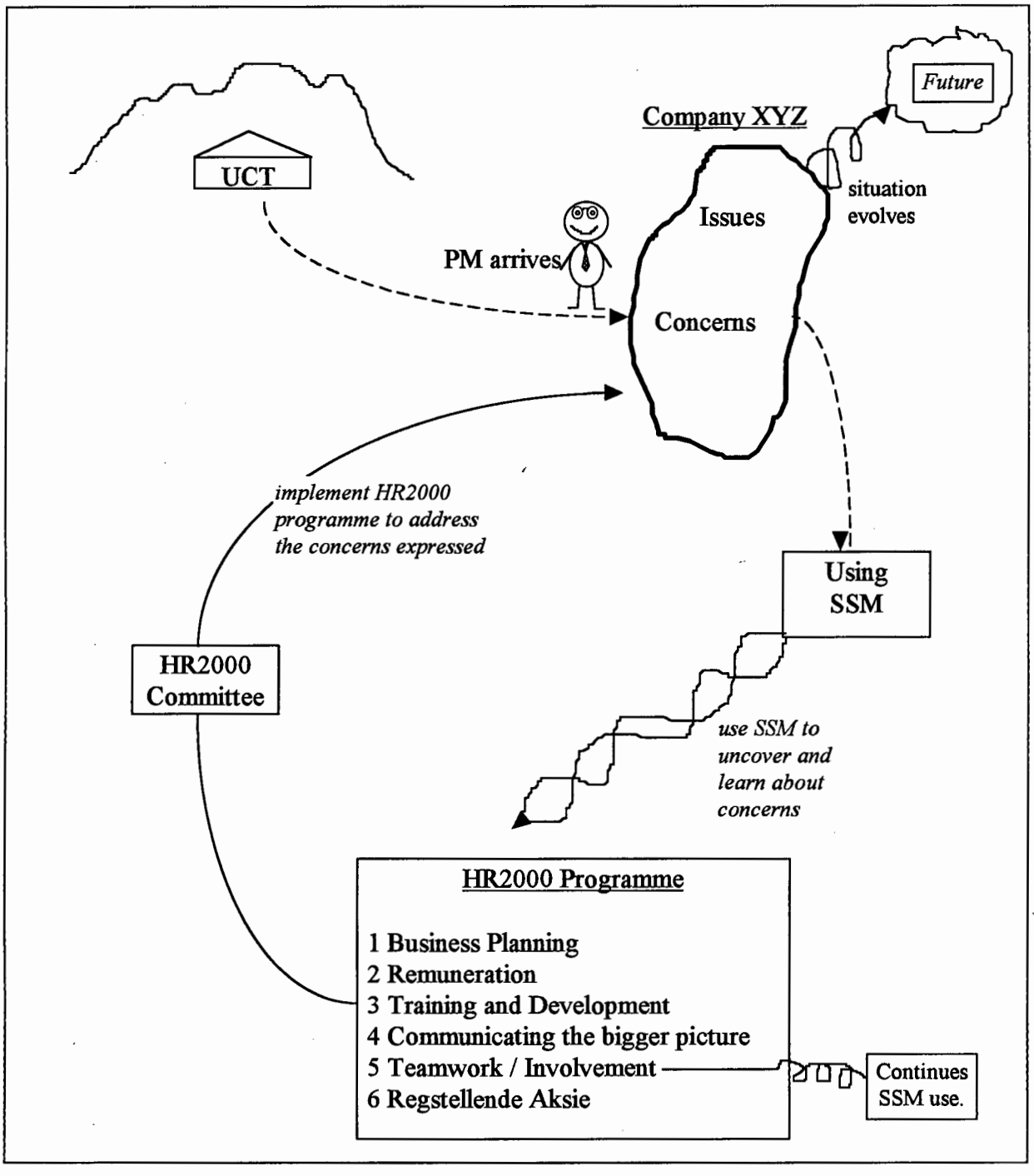


Figure 53 - A Synthesis of the Whole Project

3. REFLECTING ON THE PROJECT[oo]

This chapter reflects on the learning achieved during the project from the following perspectives :

(i) The project will be evaluated as a theoretical application of SSM i.e. did the project correspond to the theoretical descriptions of SSM presented in Chapter 1 ?

(ii) The project will be examined for the learning generated in the different stages of the cycle.

(iii) SSM will be examined for some of the inherent weaknesses of the approach.

(iv) An overall assessment of the achievements of the project will be undertaken.

(v) The project will be synthesised into a cohesive whole.

(vi) The author will reflect on his own learning from the project

[oo] Included in Appendix 6 is a summary of the time spent on the project.

3.1. An Evaluation of the Execution of the Project

The following sections will examine critically some aspects of the execution of the project.

3.1.1. The Choice of the Lockean Community

Key to SSM is the choice of the Lockean Community (see Section 1.4.2) . Two major weaknesses were, thus, inherent in this project.

Firstly, the project focused mainly on the manufacturing side of the company and therefore the findings can only reflect views from that side of the organisation. Other issues may have arisen had the sales, marketing and administrative areas been included. The results are valid, therefore, only for the manufacturing operations and not necessarily representative of the whole company.

Secondly, the group chosen to participate were (with one exception) all senior managers. No operators or supervisors were included in the group which may cause the results obtained to be unrepresentative.

3.1.2. Gathering the Data

The initial interviews provide the data source from which the project was constructed. Sixty interviews were undertaken (about 10% of personnel), which caused a minor data overload. Distillation of the main themes and interesting perspectives was time consuming because of the diversity of data.

In addition, the 'safety clause' (an offer at the end of each interview for others be involved if they so chose - see Section 2.2) was not used and calls into question the assumption that the interviews are representative of the whole workforce.

3.1.3. Dealing with Strategic Issues

As the project involved senior managers and was the first specifically to address soft issues, much of its content is necessarily strategic in nature. The consequence is that during the comparison and defining change stages, the models built were not present in the organisation at that time. The project, therefore, sets a new strategic direction for human resource processes. Continuation of the project will lead to dealing with the details of the implementation phase and any new problems that this may create.

3.1.4. The Logic of Stage 4

The logical modelling of the root definitions required in Stage 4 of the process was a cause for some concern. Whilst the author endeavoured to guide the participants through the modelling process, most of the models were developed by the author and agreed by the other members of the group. Only two of the four participants grasped the logical modelling process, without help, which may cause problems for any continued beneficial use of SSM within the company.

3.1.5. Spreading the Learning

There was much debate on feedback to those involved in the interviews. The aims of the project had specified that the line-managers (Group 2) were to be taken through the learning resulting from the project. There were two options, either to take Group 2 along the path of Group 1 and hopefully arrive at similar conclusions; or, to attempt to accelerate their progress through the thinking of the project and continue the learning through the implementation phase. Whilst ideally Group 2 would have been taken through the whole process, in practice the line managers would only be directly involved in two of the areas (namely : training and development and teamwork/involvement). Thus, the findings of the project were presented to them, discussed for consensus and followed by detailed examination of the areas of training and development and teamwork/involvement.

3.2. Identifying the Learning that SSM Generates

This section reflects on the learning that SSM enabled during the project.

3.2.1. Surfacing Multiple Perspectives

Stage 1 of SSM, encapsulated by the interviews in this case, brought to the surface the multiple perspectives present in the organisation. Two learning points emerged.

- SSM lends credibility to the uncovering of the multiple perspectives; participants gained from listening explicitly for these views and making sense of the underlying arguments. The process highlighted that divergent views would be present and should be sought.

- the gathering of views and subsequent discussion leads to a deeper understanding of the underlying logic which is implicitly contained within a view.

3.2.2. Revealing Underlying Justification

In addition to surfacing multiple perspectives, the use of SSM encourages underlying justifications of suggestions or comments to be revealed through discussion; in the interviews many of the questions (of the sort "why do you say that?" or "why will that work?") encouraged interviewees to develop the underlying argument for their viewpoint. Indeed, later in the process (Stages 5 and 6), when actions were being proposed and explored, there was much debate of the underlying assumptions of why particular interventions would cause specific results.

3.2.3. Convergence on the Real Issues

The themes of Stage 2 developed and changed during the latter stages of the process, as shown in Figure 54, but a brief explanation may be beneficial.

Themes that became apparent from the interviews and subsequent expression of the data during Stage 2 were : affirmative action, remuneration, training/ development and communication; the perspective of the Union, (an interesting way to view the company), was also included for further exploration. Communication and the Union's perspective evolved as they were discussed and structured by SSM; remuneration, affirmative action and training/development remained largely unchanged.

The five labels (affirmative action, remuneration, training / development, communication and the Union's perspective) that were identified in Stage 2, evolved during the formulation of RDs in stage 3 and in the transition to the modelling of Stage 4. Affirmative action, which has many and varied connotations in the current South African context, broadened to regstellende aksie - a more macro concept of 'putting things right'. The communication theme developed in a more considered way. In discussions with the author's supervisor, it was suggested that communication should be seen as a generic label for a series of underlying problems and that an attempt should be made to surface the real issues.

The author therefore reviewed the notes taken from the interviews and in discussing the comments with Group 1, it was decided that two underlying strands became apparent : Firstly 'you don't communicate with me' referred to an underlying desire to know more about the 'bigger picture' of company performance, direction and reasoning for investments etc.. Communication was used as a substitute for a feeling of frustration, confusion or marginalisation from issues considered to be of importance and interest. Secondly, communication was being used to express a desire for more involvement, ' you don't communicate with me', meaning 'I am unable to make decisions that directly affect me, I want to be more involved'.

Thus communication, at Stage 2, was expanded to 'communicating the bigger picture' and 'involvement' at Stage 3.

The emerging issue of involvement prompted a debate about teamwork. Whilst the merits of teamwork were espoused for operators, there was no real evidence of the existence of a cohesive management team. Teamwork was, therefore, introduced as a additional label to be explored by the modelling of Stage 4.

During Stage 5, the ideas around involvement, teamwork and the Union's perspective, merged into debate of the Group 1's conceptualisation of teamwork, its aims and motives and united to form the teamwork/involvement project that was specified in Stage 6. The labels of the other themes remained the same but the Group's understanding of each label had increased as a result of the modelling and discussion process.

It also became clear, when discussing culturally feasible and systemically desirable change in Stage 6, that many of the concerns centred on the need for business planning to be well formulated and integrated to give a strategic direction to the other initiatives. It was agreed therefore that this issue also should be addressed specifically.

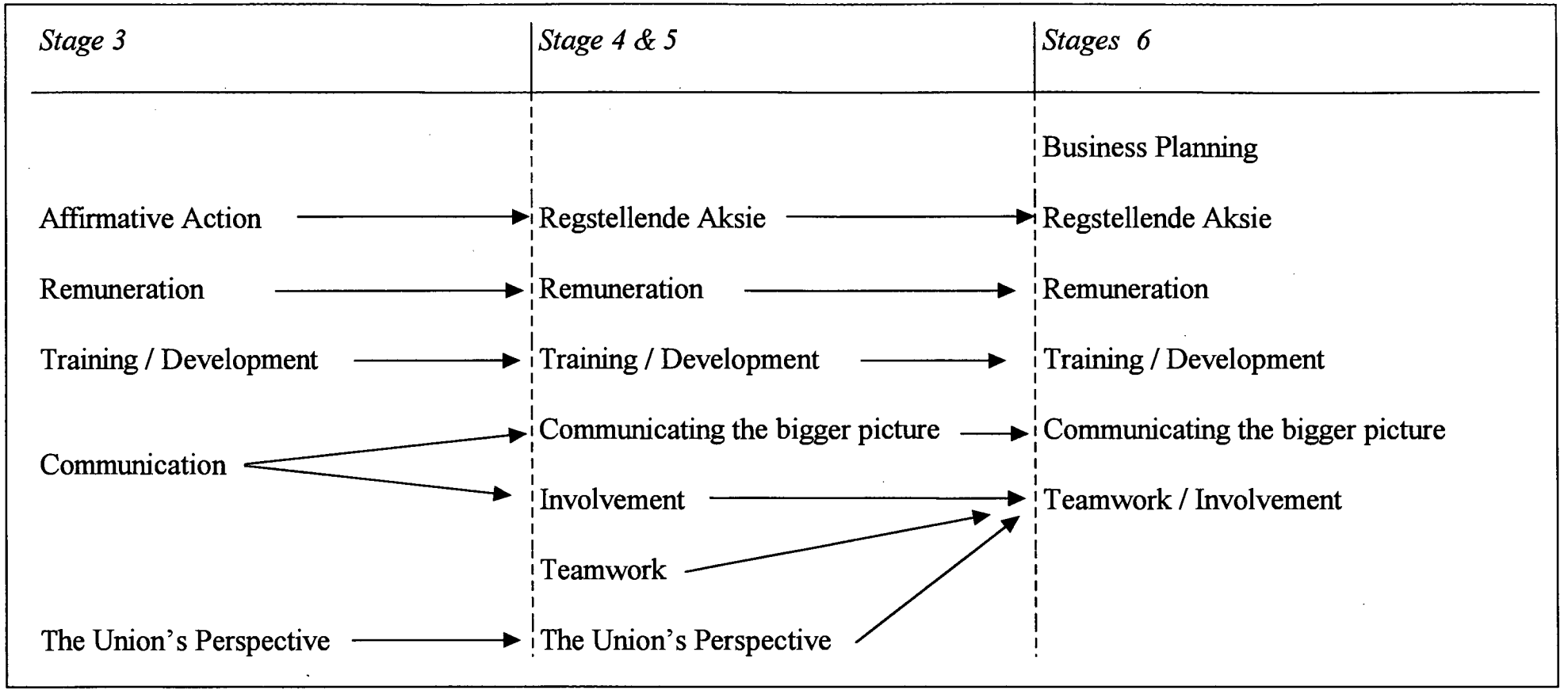


Figure 54 - Evolution of the main issues addressed during the project

3.2.4. Consensus on Action

Section 3.2.3, considered how extensive discussion of emerging themes had led to their evolving and focusing on the real issues. This process is closely related to the consensus on action apparent in Group 1 by the end of the project.

Meeting regularly over five months, members of Group 1 were familiar with the issues being addressed. Whilst at the time, the evolution of the issues was seen as a natural process driven by a progressively deeper understanding of their content, it is now clear that it was a learning process which led to the uncovering of the real issues.

By the end of the process, Group 1 had reached an inherent consensus on actions to be taken to address the issues that had emerged (rather than being specifically proposed). The learning process had led to the Group reaching a higher level of awareness from where interventions were more easily identified.

The inherent consensus in fact caused minor problems towards the end of the project, which helps to demonstrate the ability of SSM to develop consensus on action : The MD had left the group after Stage 2, due to constraints on his availability. His re-entry at Stage 6 meant that he had missed the structuring and discussion of Stages 3, 4 and 5 and was confronted by the series of proposed projects which had been formulated in his absence. It was necessary, therefore, that the group retrace the steps that had been taken to reach the proposed courses of action, in order to demonstrate to the MD how the framework for these projects had been developed. Once he had been exposed to the evolution of the issues, the group reached consensus that the projects indeed constituted a coherent attempt to address the key issues. Whilst this process has been described as a minor problem, it was a very valuable review of what had taken place over the previous months and it gave structure to the proposed interventions.

3.2.5. The Learning of Group 1

Learning is the key to SSM and it would be useful to give an impression of the Group's understanding of SSM and their learning from the project.

3.2.5.1. The Managing Director

Whilst the MD was instrumental in initiating the project, the demands of his position meant that he was unable to be present for Stages 3 to 5, (six afternoon sessions). Having studied at Masters level, the overall objectives of the methodology seemed to present no real problems. Unfortunately, having not been at Stages 3 to 5, he missed much of the emergence of the actions that were proposed.

3.2.5.2. The Human Resources Manager

Undoubtedly the HR Manager saw the benefits of SSM. He was particularly interested in its application to the issue of affirmative action- whether or not this was an emerging theme from the interview stage. The idea of the recursive nature of the company's programme, the author believes, helped him to construct a better mental model of the current and potential initiatives that the organisation could facilitate. (Figure 41, page 87, in part illustrates the affirmative action programme working at different recursive levels.)

3.2.5.3. The Operations Manager

The operations manager appreciated the advantages of SSM and proposed that it be used, with his line-managers to explore the issues of teamwork and participation.

3.2.5.4. The Human Resource Department Participant

The participant, having studied to M.Sc. level, had no problems with the methodology and may be competent to facilitate any further projects involving SSM.[pp]

[pp] For details of the specific development of SSM facilitation skills see Appendix 5.

3.3. Criticisms of SSM

Having used SSM in the project, it is necessary to evaluate the methodology in a more macro sense. The following sections explore three aspects of the methodology that are considered central to its successful use.

3.3.1. The Crucial Lockean Community

Central to SSM is the concept of the Lockean Community. The first chapter described the concept (see Section 1.4.2), and this section will consider some problems that this concept creates in a practical application of SSM.

One of the key problems is to identify the constituents of the Lockean Community. Ideally everyone in the problem situation (including those who may be external to the organisation but have some interest in or potentially valuable input to resolving the situation) should be included. Even in smaller organisations this scale of involvement would be a major undertaking and a reduction in the total participants will be necessary to produce a manageable process. This is not a practical problem in using SSM, in reality it is a fundamental theoretical problem because of the type of inquiring system SSM (and every other participative process) represents.

A group must be selected based upon, amongst other criteria, the diversity of views about the situation and the ability to contribute to a learning process. In addition to the problem of a representative group, a second and more complex issue of the learning that SSM generates must be considered. The group will undergo a learning process (given that the SSM process is undertaken correctly), which will give the group a higher level of understanding about the issues than when they were initially chosen. Their heightened awareness of the problem situation implies that the group will no longer be representative of the community from which it was drawn initially. This is a key issue which will be explored further in the following sub-section.

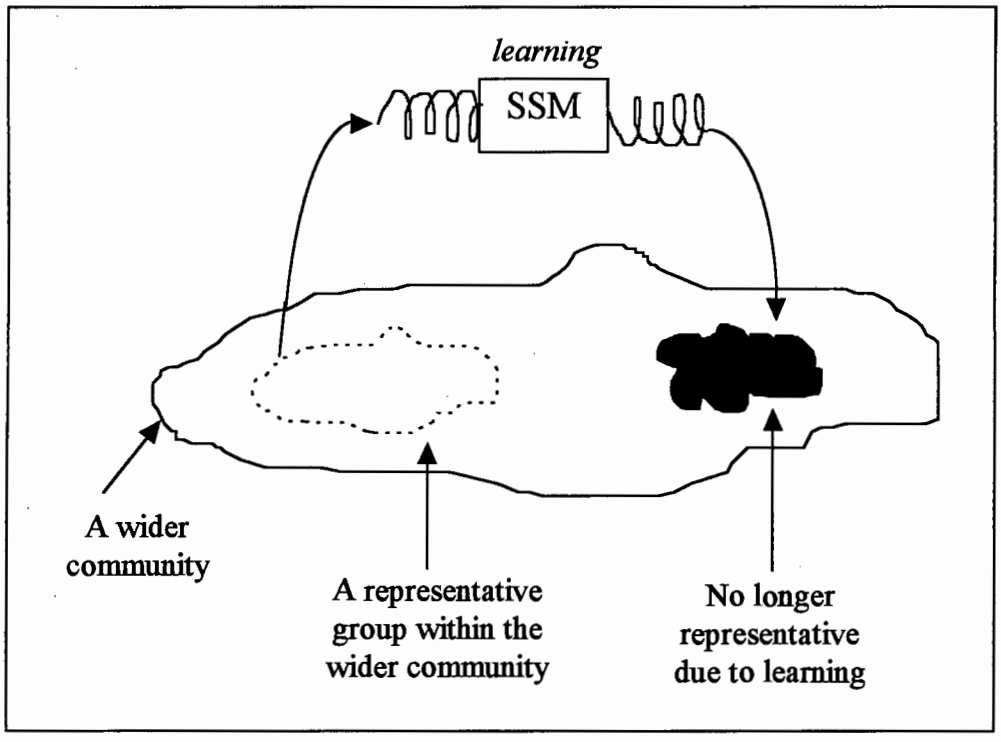


Figure 55 - The Problem of Representative Groups

3.3.2. Spreading the Learning

The idea of a Lockean community is central to the use of SSM (see Sections 1.4.2 and 3.3.1). In any practical application of SSM, compromises will have to be made about who will be involved in Stages 1 to 5. The question in the two subsequent stages, 6 and 7, then becomes how to share or spread the learning about the perceived problems.

A small group will have been through the process and will have formulated an understanding of the problem situation that needs to be shared. Brief discussions or presentations of the results may not have the desired effect of significantly changing the way that the audience views a particular situation. This aspect of SSM will not be pursued but techniques seem to be emerging, such as 'Open Space Technology'[61] that may contribute effectively to spreading the learning from similar exercises.

Group 2, (defined as the wider community) spent an afternoon discussing the project. Whilst there was consensus that the results of the project were focused correctly, Group 2 cannot have internalised all the learning that Group 1 achieved by undertaking the whole process. To redress this problem partially , Group 2 will carry out an SSM process which will focus on learning about teamwork/involvement; in addition it is hoped that the group will internalise the SSM process and perhaps initiate similar projects within their own departments.

3.3.3. SSM - A complete cycle ?

The discussions on SSM's place in the scientific method (see section 1.4.1) have revealed that it should not be considered as a whole cycle of the scientific method of enquiry, if used alone. The place for SSM is discussed in the first chapter (see Section 1.4.1 and 1.6), but the arguments for its position only became clear mid-way through the project. It is critical to realise that, whilst SSM is strong in the abductive phase of enquiry, it leaves the inductive to the actual implementation of the proposals. It is clear that a suitable inductive technique will combine well with SSM to enable the interventions to be tested before being used in the actual problem situation.

3.4. An Overall Assessment of the Project

Having reported the detail and analysed the project from a theoretical point of view, this section will assess the project overall, review its achievements, identify what changed in the real situation and record what actions were taken.

Before the author contacted the company, there had been a realisation that there were problems needing attention. (e.g. the HR2000 committee had been formed to tackle human resource issues). The arrival of the author was fortuitous, as it brought a methodology, which the company lacked, to grapple with the softer types of problem that required resolving.

SSM offered a way to legitimise and deal rigorously with the multiple perspectives that existed within the organisation. This step, of acknowledging and discussing mutually opposed views was, in itself, a major step forward. In effect the problematical issues no longer needed to be suppressed. SSM gave a non-threatening framework within which contentious issues could be discussed and learned about. Using SSM to explore the views, deepened the understanding of the different perspectives surrounding the various issues. The process of discussion and the resulting learning enabled the real issues to be brought to the fore and agreement reached that specific actions would indeed address the perceived problems.

The integration of the individual actions into the framework of the HR2000 programme gave the outcomes of the project a legitimacy and urgency which ensured that momentum would be maintained. Finally, the organisation went part of the way to internalising SSM as another problem solving tool. The success of interventions initiated as a result of this project will show whether or not SSM will be fully utilised.

3.5. A Synthesis of the Project

The results of the process are summarised in the diagram below:

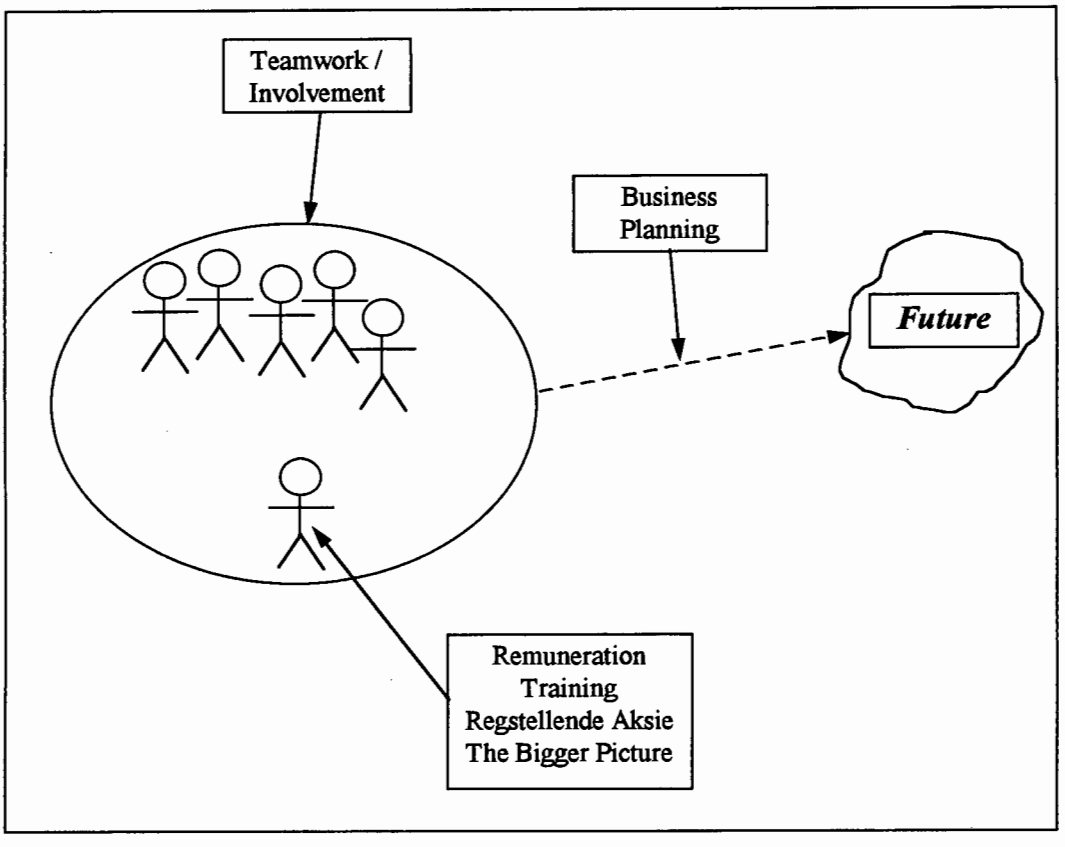


Figure 56 - A Synthesis of the HR2000 Programme

The integration of the project into the broader framework of the development of the organisation as a whole is shown in Figure 57. The author arrived from the University to help address some of the current issues and concerns within the company. Using SSM as a learning process, the HR2000 programme was developed to address the concerns. The implementation of this programme should allay the specific concerns with which it deals, however they will recur or be replaced by other issues as the situation develops with time.

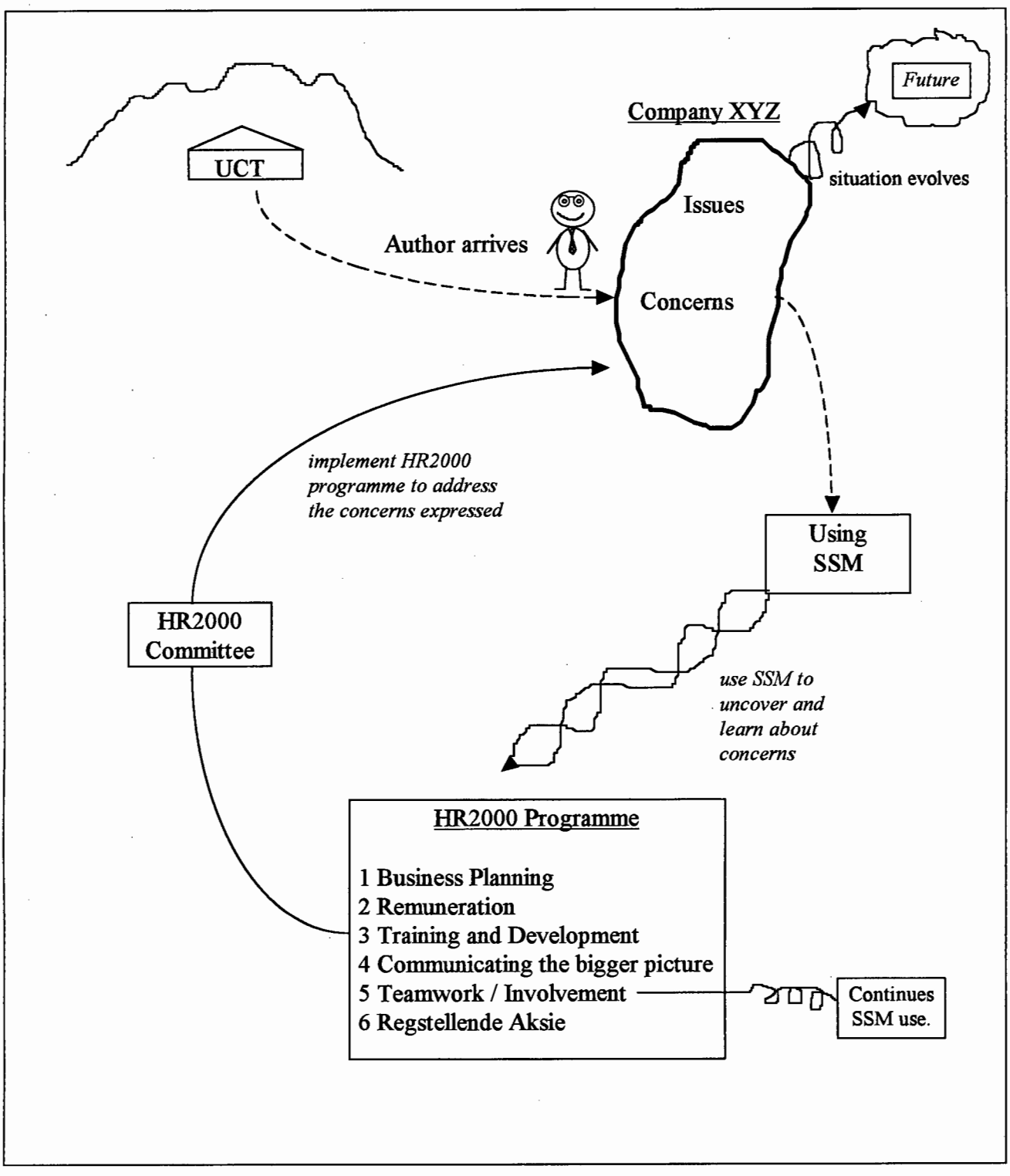


Figure 57 - A Synthesis of the Whole Project

3.6. The Author's Personal Learning

In the following sections the author will attempt to describe his learning during the project. This section will constitute only part of the total experience, but the points presented represent the major learning.

3.6.1. Facilitating a Learning Process

The author was both the facilitator of the process and the "expert" on the methodology. Initially there was an inherent desire to become involved with the content of the project, as well as concentrating on the process.

Having been involved in many projects where he was expected to develop and propose a solution to the problem (this being the deliverable of the project) the temptation was to impose a single view. In SSM terms the author's proposal would represent one view of a solution to the problem situation; inherent in the proposed solution would be a definition of the problem and the associated worldview. Within two months the author deliberately made a transition from describing and arguing his perspective on the issues being discussed, to concentrating on facilitating the group in discussions and ensuring that divergent views (gleaned from the interviews) were included in the discussions. Effectively the interventions were derived by the participants in the project, with the author ensuring that the enquiry conformed to the methodological principles of SSM and that divergent views were not rejected from the process.

3.6.2. Appreciating the Difference that is SSM

SSM had been chosen as a different approach to problem solving. A background in engineering, had exposed the author to 'hard' approaches to problem solving and SSM would expose him to a different 'softer' approach.

In reflecting on SSM once the project had been completed, it became clear that SSM articulated a process of enquiry that was completely different from the more familiar harder approaches. This section will attempt to highlight the key differentiating concepts within SSM.

The first key concept within SSM is the legitimacy of multiple perspectives in a soft problem situation. Each view or definition of the problem is directly linked to a worldview that makes it meaningful. To say, therefore, that one cannot see the rationale behind an individual's expression of the problem, is to admit that one has not comprehended the worldview with which it is associated. It is an admission that insufficient effort has been put into understanding (but not necessarily agreeing with) the worldviews expressed. Checkland, thus, legitimises the existence of divergent, if not contradictory, worldviews, allowing them to be valid simultaneously. In order to amass as rich a picture of the problem situation as is possible, participation in the problem solving process becomes the second key ingredient.

The problem solving system will thus be presented with a rich mass of divergent opinion and the choice then becomes how to proceed. From the mass of information two sets of observations should be derived : First, the recurring themes suggest that a particular area is cause for concern and is worth investigating further. Second, interesting perspectives on the problem situation will also be expressed and these should also be included as they provide an opportunity to explore an uncommon perspective on the problem, which present a learning opportunity.

Given that the participants in the process will allow contradictory views to exist simultaneously, the process from Stage 2 to Stage 5 (taking a worldview as given and exploring the implicit assumptions associated with the view through a process of modelling), catalyses a learning process. It is not the models that produce the actions to be taken, but rather the process of discussion and familiarisation with views of the problem situation; this enables a higher level of understanding to be reached, from where appropriate actions become clear.

It is important to realise that SSM does not call for the causes of the problems to be diagnosed, as in more traditional problem solving. The emphasis is on change: Exploring potential transformations in the problem situation and hypothesising how to create the conditions for these transformations to occur.

3.6.3. Placing SSM into the Method of Science

Whilst Section 1.4.1 Placing SSM in the Process of Enquiry, has described SSM's place in the abductive phase of the method of science, it took time for this to become clear. Placing SSM within a philosophical framework of the scientific method of enquiry highlights that the use SSM does not, in itself, constitute a rigorous application of the scientific method to a problem situation. Additional methodologies are needed to supplement SSM's weakness in the inductive phase. The use of SSM in the abductive phase of enquiry will be discussed further in a paper by Middleton and Ryan[62].

3.6.4. Understanding a Transformation

It took the author time to understand a transformation in the context of SSM and it is worth dwelling on the possible interpretations. There are three aspects to a transformation which need to be integrated into the understanding of the word for use with SSM. Firstly, transformation, in it's common usage, suggests change from one state to another, as shown in Figure 58. Whilst this interpretation implies change, an important facet of a transformation is that the input will be transformed to the output; the input will be present in the output but in a different form, Figure 59.

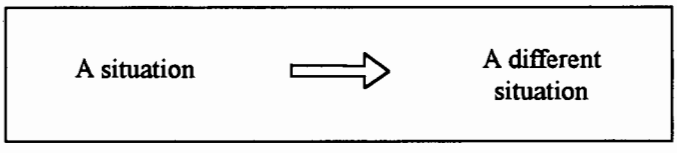


Figure 58 - A Transformation - Interpretation 1

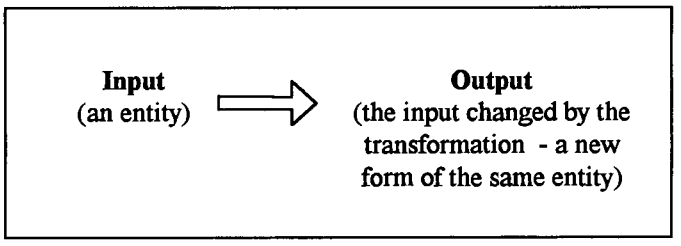


Figure 59 - A Transformation - Interpretation 2

The final aspect of a transformation concerns the system by which it is achieved. When specifying the system in the root definition it must be sufficient and necessary for the transformation to occur, Figure 60.

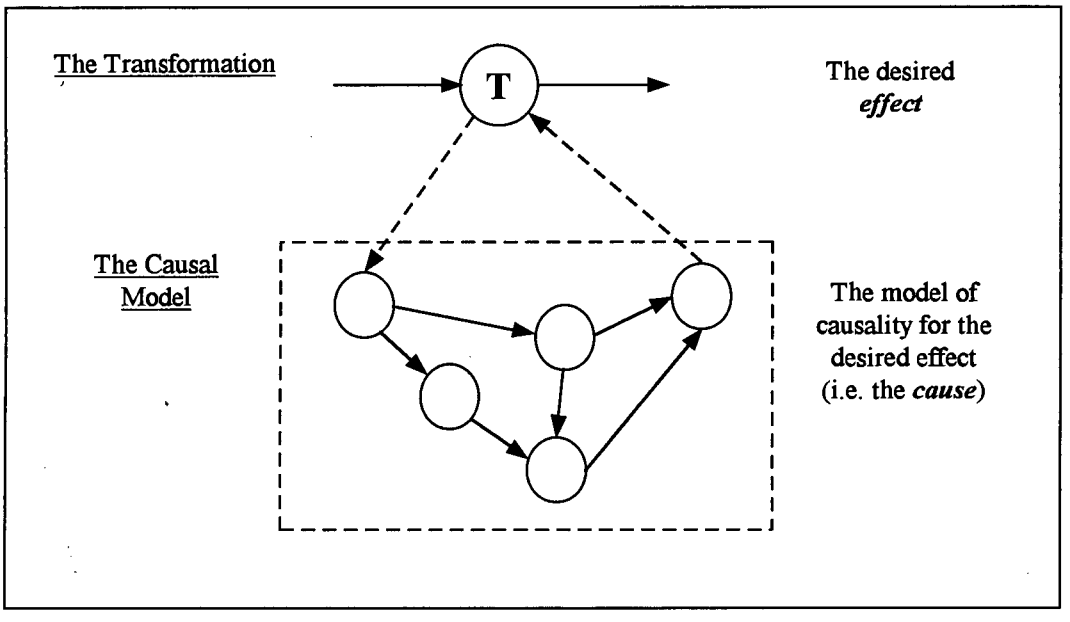


Figure 60 - A Transformation - Interpretation 3

3.6.5. Constructing Models of Human Activity Systems

For the modelling Stage (Stage 4) of SSM, Checkland[63] proposed a generic model of a human activity system, Figure 61 - A Generic Human Activity System Model.

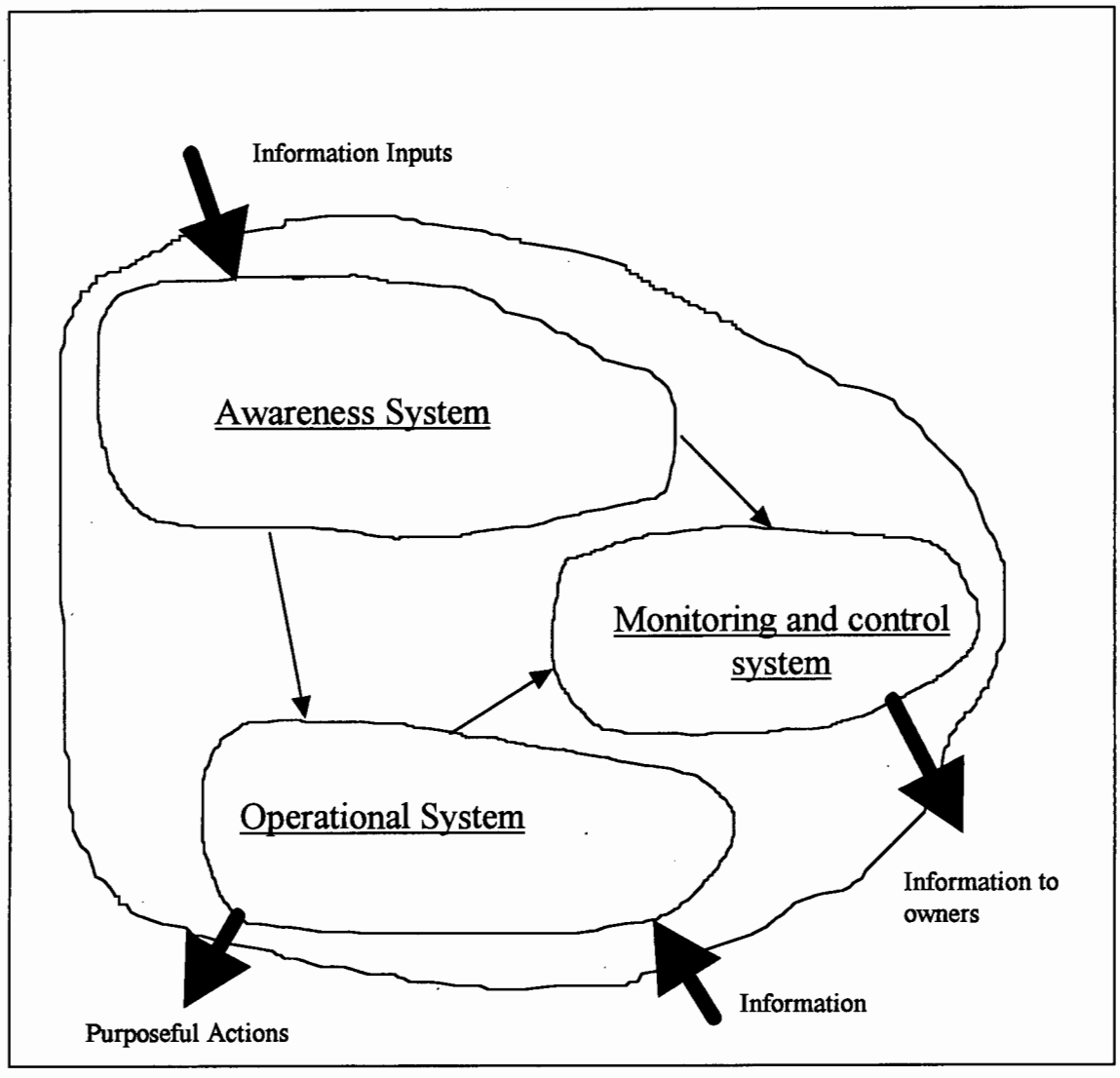


Figure 61 - A Generic Human Activity System Model

The model describes three systems which interact to produce the transformation required by the root definition. The awareness system ensures that the system gleans the informational inputs that it needs to function. The monitoring and controlling system measures the performance of the system and takes appropriate corrective action. The operational system performs the transformation specified in the root definition.

Checkland[64] mentions that other systems theory relevant to human activity systems can be used, if they are found to be suitable. He makes specific reference to Beer's model of organisation[65] and there are striking similarities between Beer's viable systems model[66] (VSM) and the generic model of human activity systems

described by Checkland. Indeed the author found that VSM provided a good checklist when constructing a human activity system model. This observation is explained in the following paragraphs.

Briefly, the viable systems model proposes *'a hierarchical model of organization which exhibits autonomous control at its various levels.'*[67] Within each hierarchical level, a generic model of the functions and interactions necessary for the continued survival of a system is proposed. The total model of a hierarchical level is illustrated in Figure 62. Within each level five systems exist, which are described in Table 13.

Table 13 - The Five Systems within the VSM

System Number	*Name*	*Description*
1	Implementation	Concerned with implementation of the systems purpose.
2	Co-ordination	Ensures that system 1's act in the interest of the whole system and do not optimise themselves to the detriment of the wider system.
3	Control	Control and auditing of the performance of the system 1s
4	Intelligence	Gathering relevant information from the wider environment in which the specific recursive level is contained.
5	Policy	Issues policy guidelines within which systems 1 to 4 and lower recursive levels of the same system must operate.

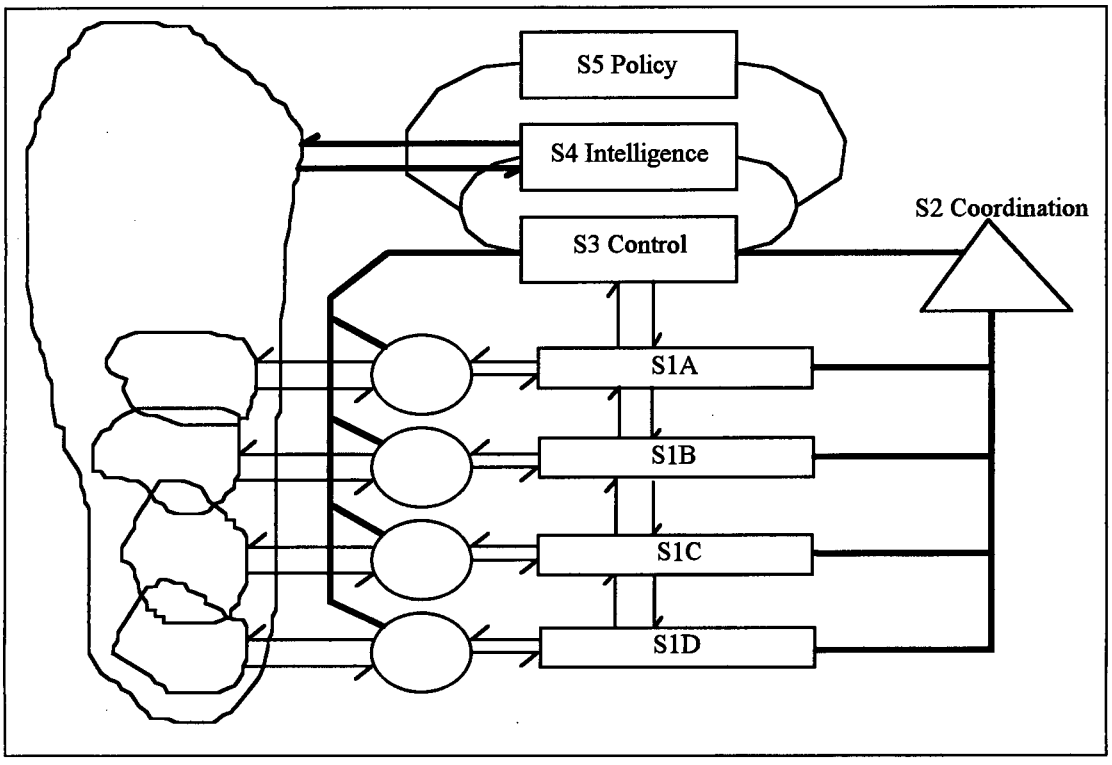


Figure 62 - The Viable Systems Model

If Beer's VSM is mapped on to Checkland's model of human activity systems, the relationship, shown in Figure 63, results.

3.6.6. From Mode 1 to Mode 2

Checkland and Scholes[68] describe the use of SSM in terms of modes 1 and 2. As the project unfolded there was a distinct transition between sequential use of SSM in mode 1 and the more random mode 2 use.

The author's view is that Stages 1 & 2 of the methodology must be carried out carefully if the subsequent stages are to be of immediate use. Further, for an inexperienced facilitator a rigorous sequential (mode 1) use of SSM for at least two projects is required to gain the confidence and competence to attempt a project using the more random, mode 2 approach.

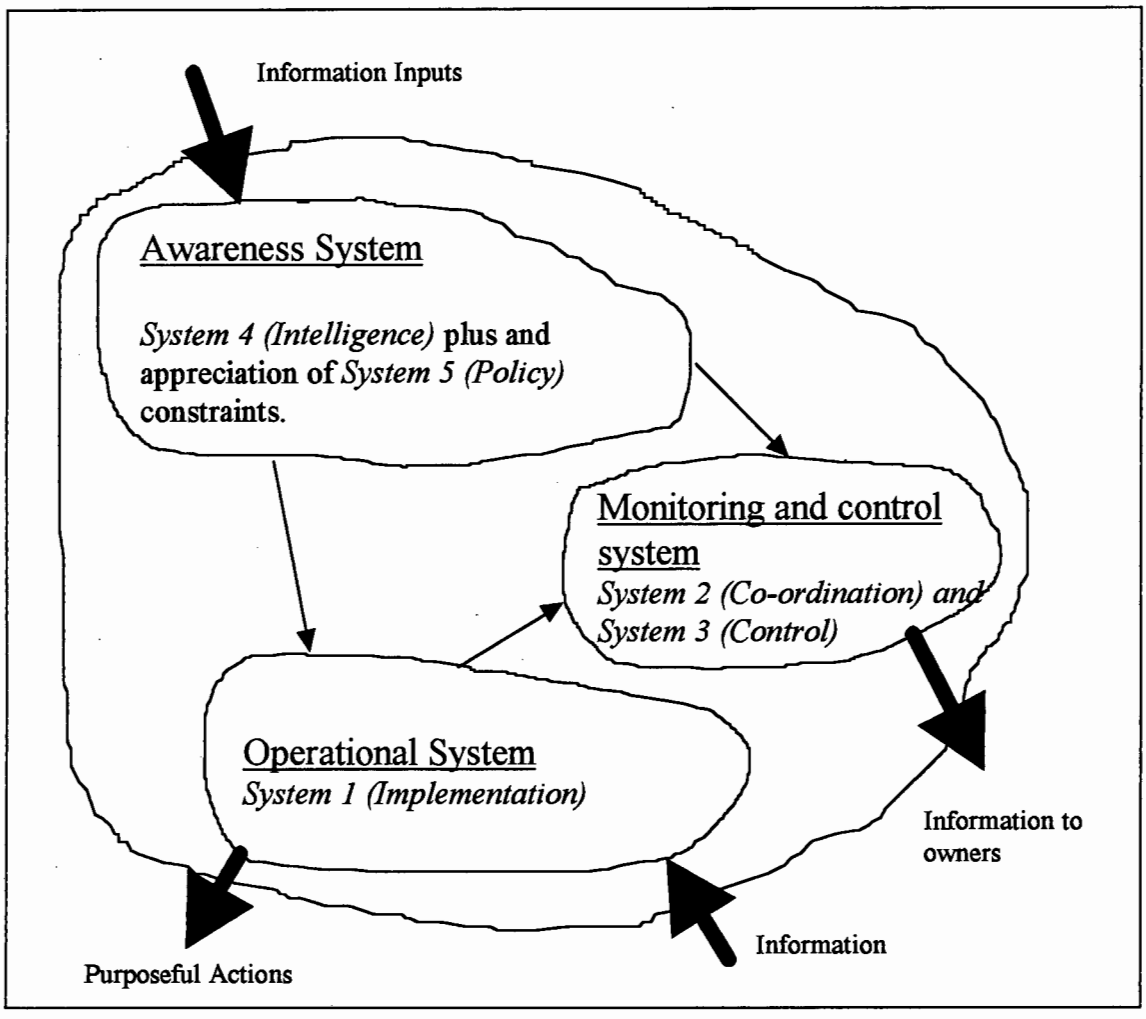


Figure 63 - Checkland's Human Activity System Model combined with Beer's VSM

4. APPENDICES

4.1. Appendix 1 : Outline of area of concern for half dissertation with Company XYZ.

Background

Company XYZ is a textile company, manufacturing fabric from yarn. The production process includes the knitting, dyeing, printing and finishing of fabric before despatch to customers.

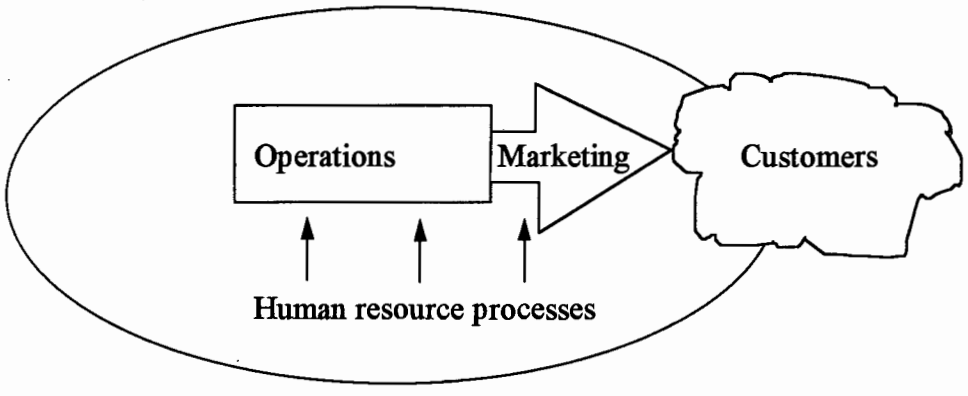
Craig Smith, the managing director, joined Company XYZ three years ago as Operations manager and has been the driver of the 'Total Quality' programme within the organisation. The programme has contributed, in part, to a significant lowering of reject rates from production and the reduction of orders being despatched late to the customer. There has also been a marked management paradigm shift, from an autocratic style, to using more participative and open management methods. The Company has re-aligned itself as a customer focused, market led, organisation.

The technical side of the business seems now to be coming into control and the emphasis has accordingly shifted, to address the human aspects of the business. To this end an HR2000 committee has been appointed to steer the companies efforts to achieving the human resource objectives for the year 2000.

A local consultant, Karen Osler, has facilitated a number of discussions to identify the concerns of the workforce. The reports on the individual sessions are almost completed, but will highlight a number of issues that need to be addressed .

Details of the project

The existing Human Resources Department is seen in a facilitation and co-ordination role within the organisation. Whilst the line managers will define, and remain responsible for, the objectives of any HR processes related to their operators, the HR function will be responsible for ensuring the efficiency and effectiveness of the processes that they are charged to facilitate and co-ordinate.



The objective of the project will be "To define the optimum human resource processes to support World Class Manufacturing at Company XYZ, within the current South African context", in order that this vision can be used to generate change within the organisation.

The proposed process

The process of enquiry will be in line with a sequential use of SSM. The objective of the process will be for the HR2000 committee to learn about different perspectives on "optimum human resource processes to support World Class Manufacturing" in order that interventions can be made within the organisation to progress towards that goal.

The first phase (Stages 1&2) will involve discussions with the parties affected by such processes in order to amass differing views of the situation.

The second Stage will involve the analysis of this information in order to highlight perspectives that may contribute to the learning process.

Sharing and discussion of the perspectives with the original groups, with an emphasis on culturally feasible and systemically viable changes that could be made, will provide the HR2000 committee with a series of views and options, from which an implementation plan can be finalised and interventions actioned.

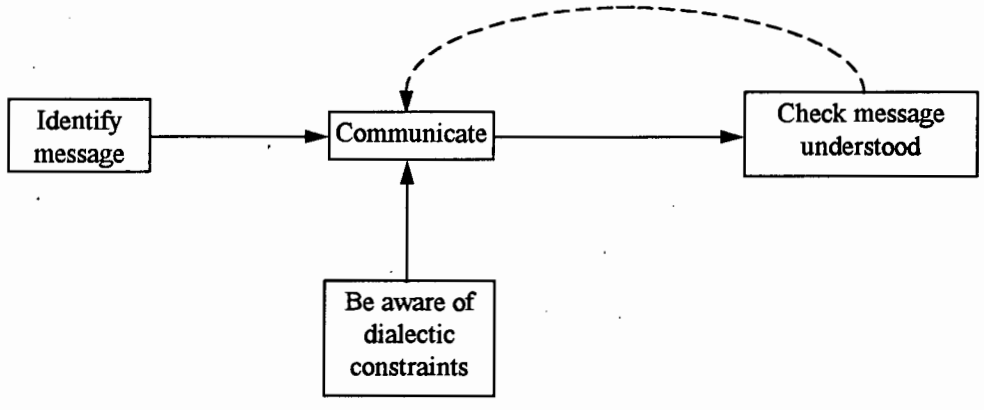
It is expected that the author will be involved again, using SSM to design and implement a specific intervention. The choice of project will be determined by the time constraints of wishing to have the whole process and results written up by the end of the year.

4.2. Appendix 2 : Models of Communication

Transformation : Poor Communication ⟹ Good Communication

DOWN THE HIERARCHICAL STRUCTURE

B H	Managers, supervisors, operators, Company ?
A	Communicator (Managers, supervisors)
W	Better communication = less confusion, less re-communication, less waste
O	Communicators
E	Recipient of communication won't forget



Measures of performance :

Effectiveness : How often are messages received right first time ?

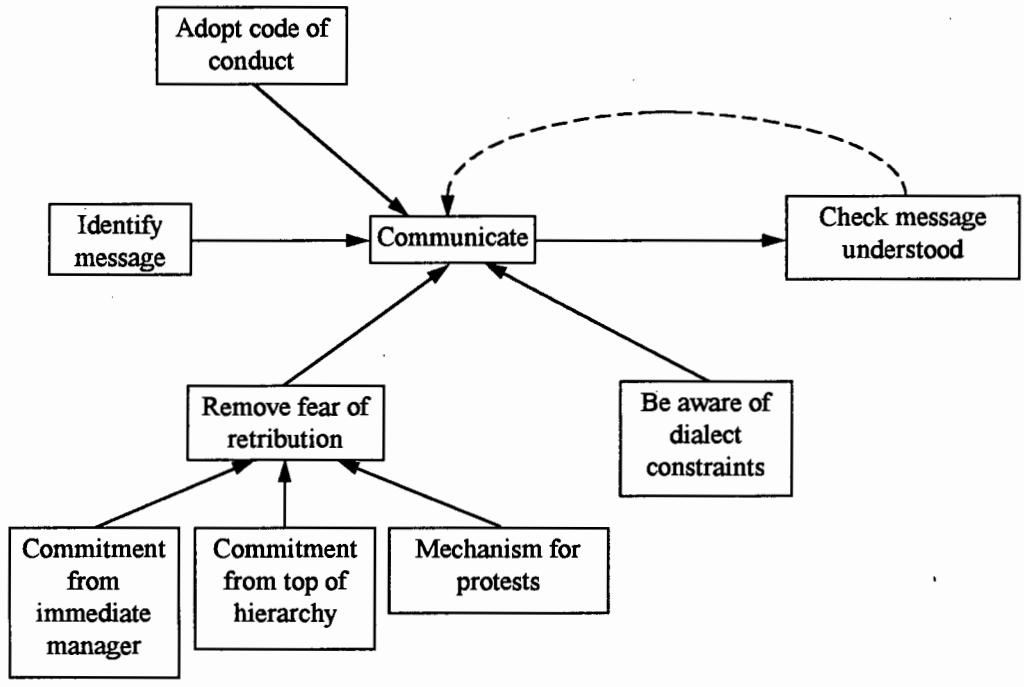
Efficiency : Are relevant messages being conveyed ?

Efficacy : Do the participants have the ability to identify relevant messages, be aware of dialectic constraints, communicate and check the message has been received ?

Transformation : Poor Communication ⟹ Good Communication

UP THE HIERARCHICAL STRUCTURE

B H	Operators, managers, supervisors, , Company Managers ?
A	All employees
W	Better communication = important issues are addressed, no strikes, ill feeling etc.
O	Communicators, management
E	



Measures of performance :

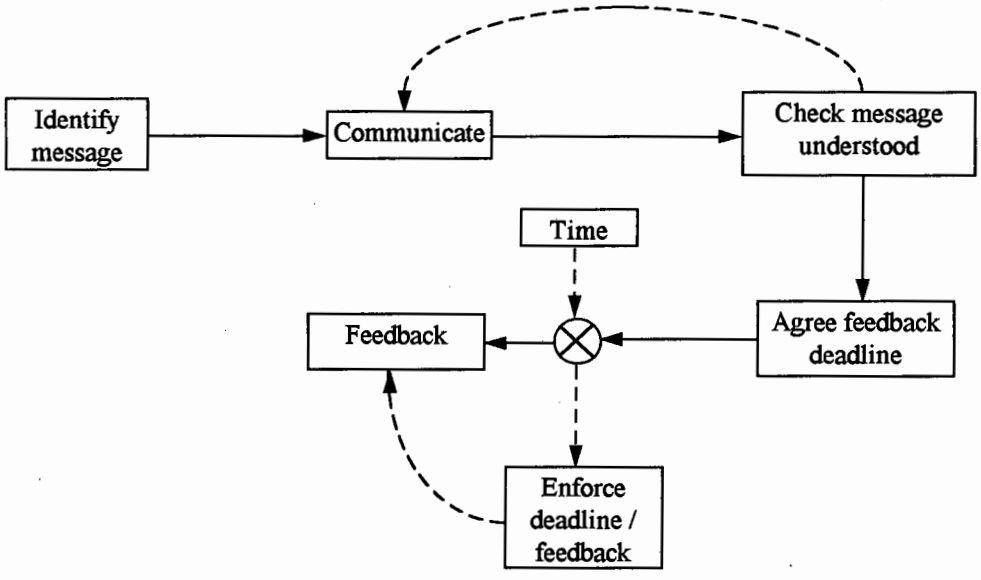
Effectiveness : How often are messages received right first time ?

Efficiency : Are relevant messages being conveyed ?

Efficacy : Do the participants have the ability to identify relevant messages, be aware of dialectic constraints, communicate and check the message has been received ?

Transformation : Poor Communication ⟹ Good Communication with timely feedback

B H	Operators, managers, supervisors, , Company Managers ?
A	Recipient of communication
W	Better communication = important issues are addressed, people are kept informed
O	Communicators
E	



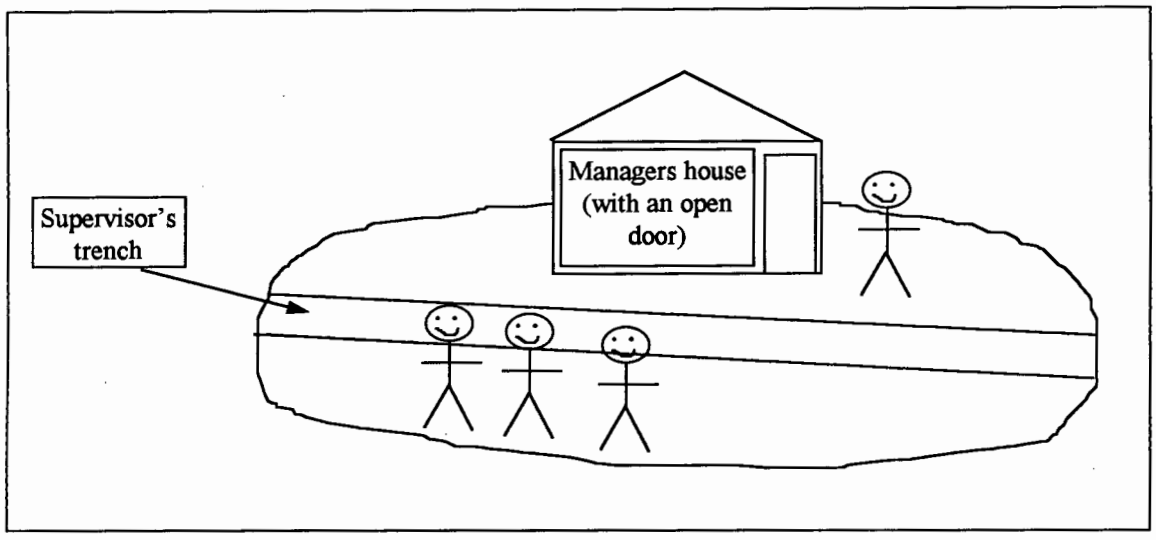
Measures of performance :

Effectiveness : How often is feedback received before the deadline ?

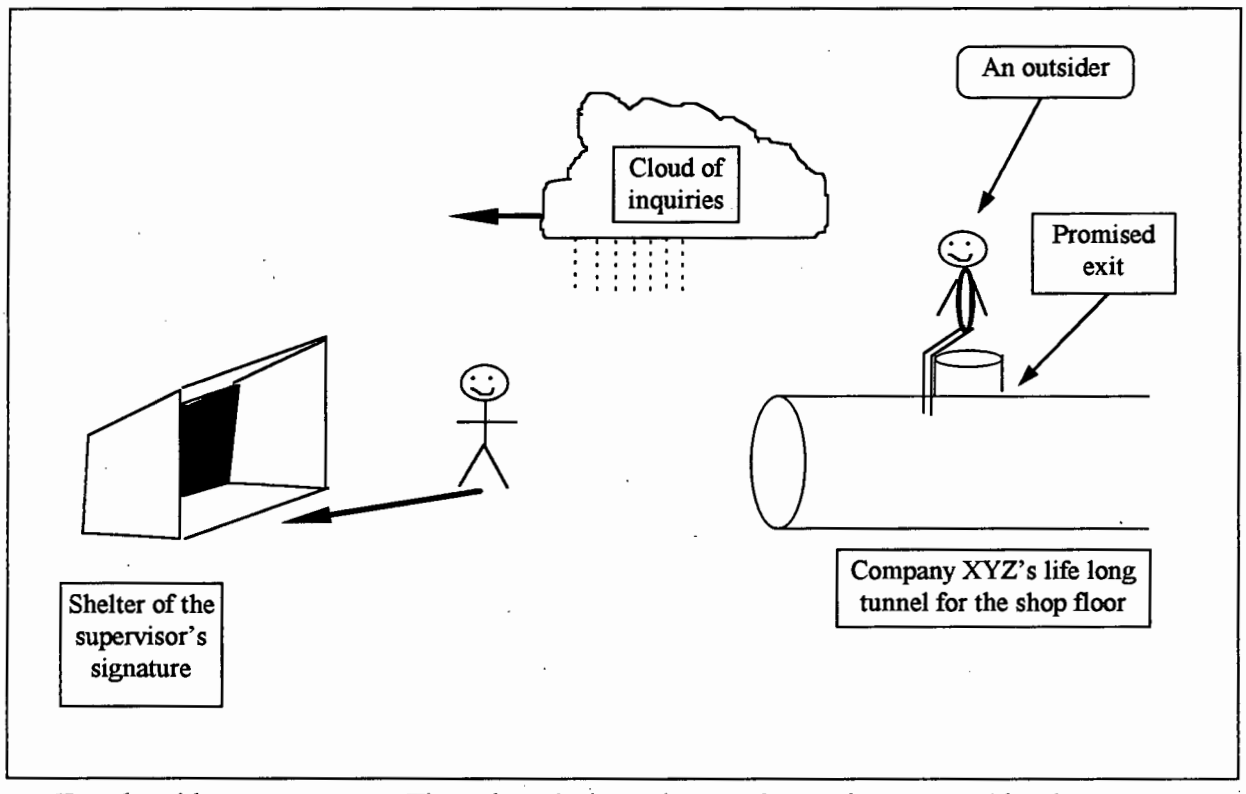
Efficiency : Are relevant messages being conveyed , what is the average feedback time?

Efficacy : Do the participants have the ability to identify relevant messages, be aware of dialectic constraints, communicate and check the message has been received ?

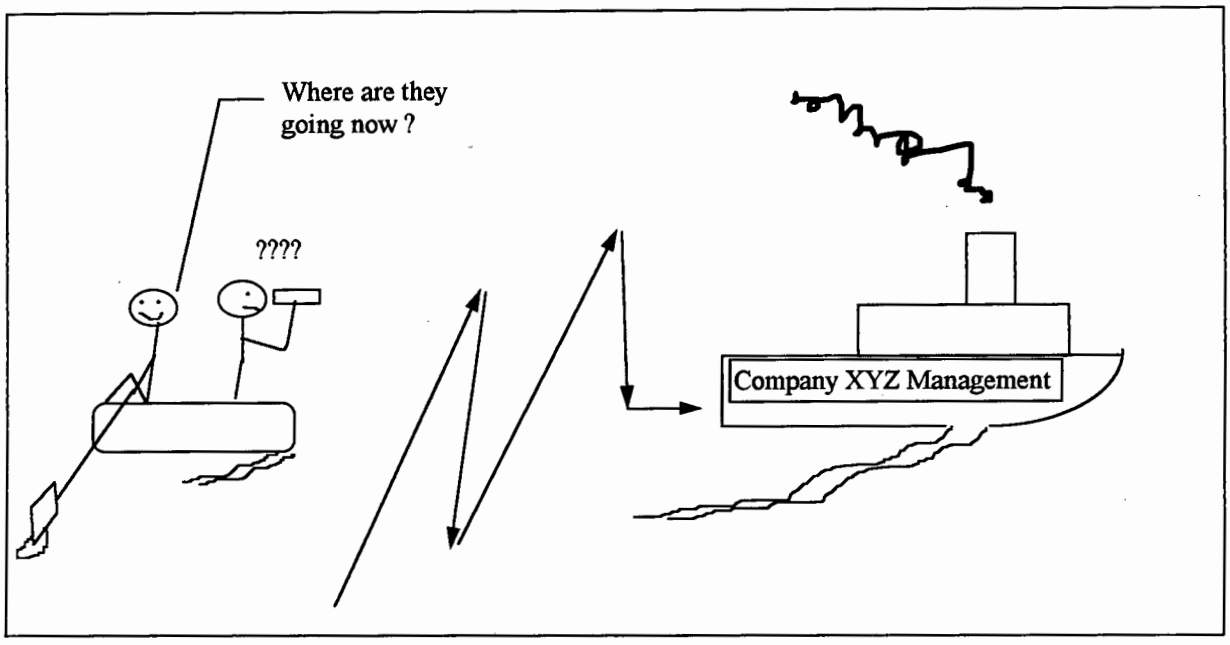
4.3. Appendix 3 : Examples of Rich Pictures



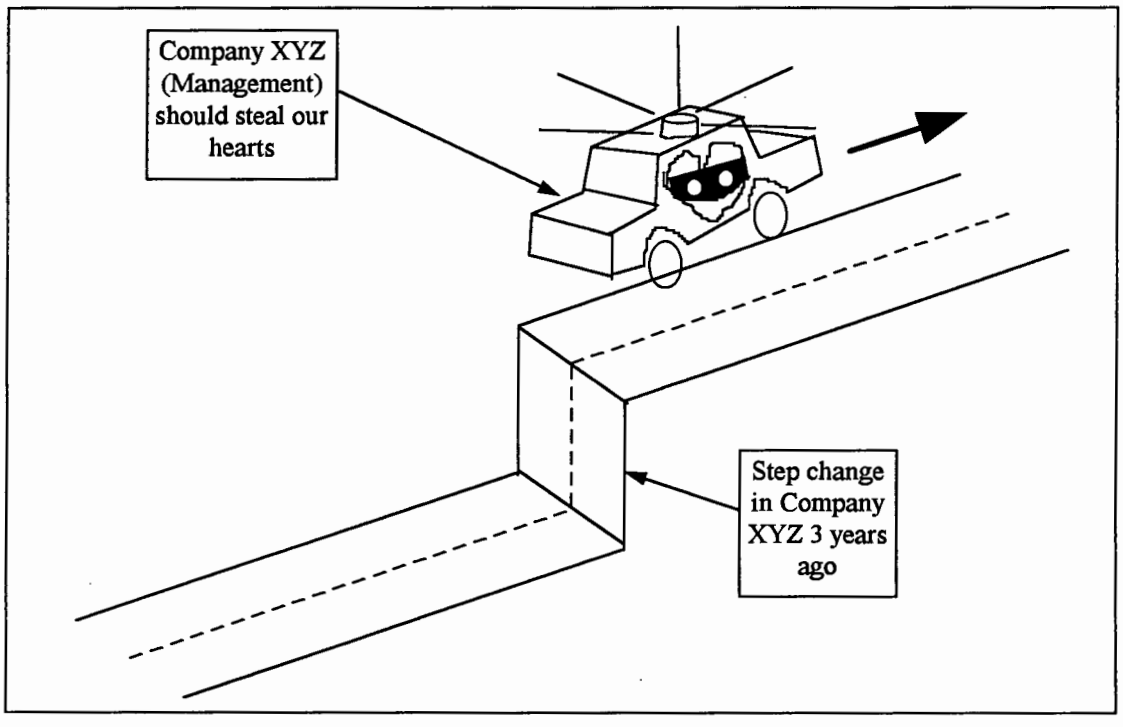
The manager has adopted an open door policy, which he assumes will keep the lines of communication open. In reality, however, the Supervisor forms a barrier as the manager insists that things should go through the Supervisor first.



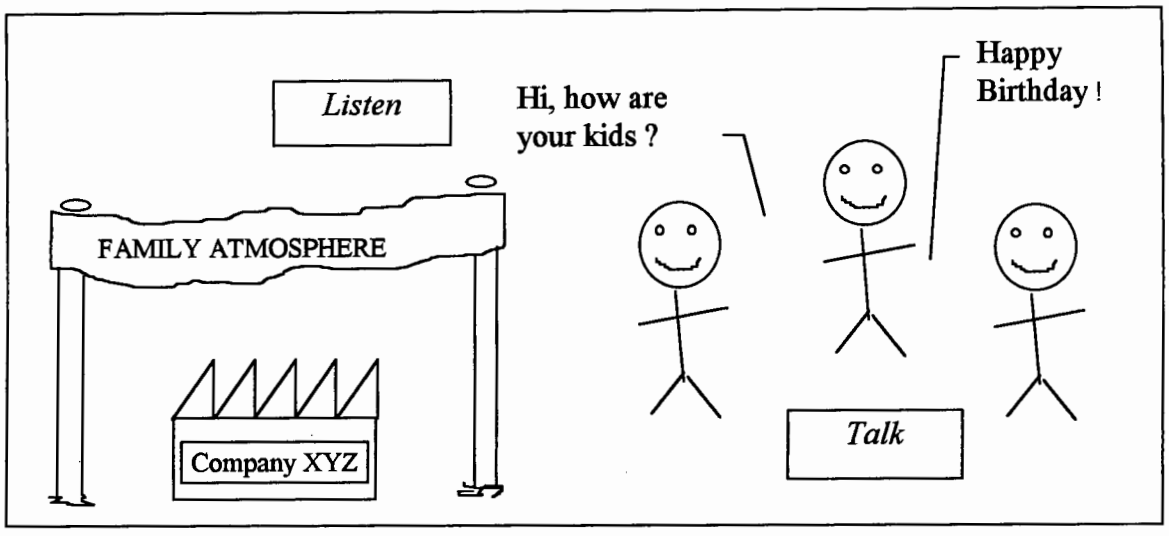
Two key ideas are present. First, there is from time to time a threat posed by the possibility of being sent to an enquiry for doing something wrong. When this threat is present the easiest thing to do is to protect yourself by getting the Supervisor to sign off the decision. Second, working life is seen as a tunnel down which one must crawl. Occasionally you come across an exit, but as soon as the light is seen, an outsider comes and sits on the exit, closing it off to those in the tunnel.



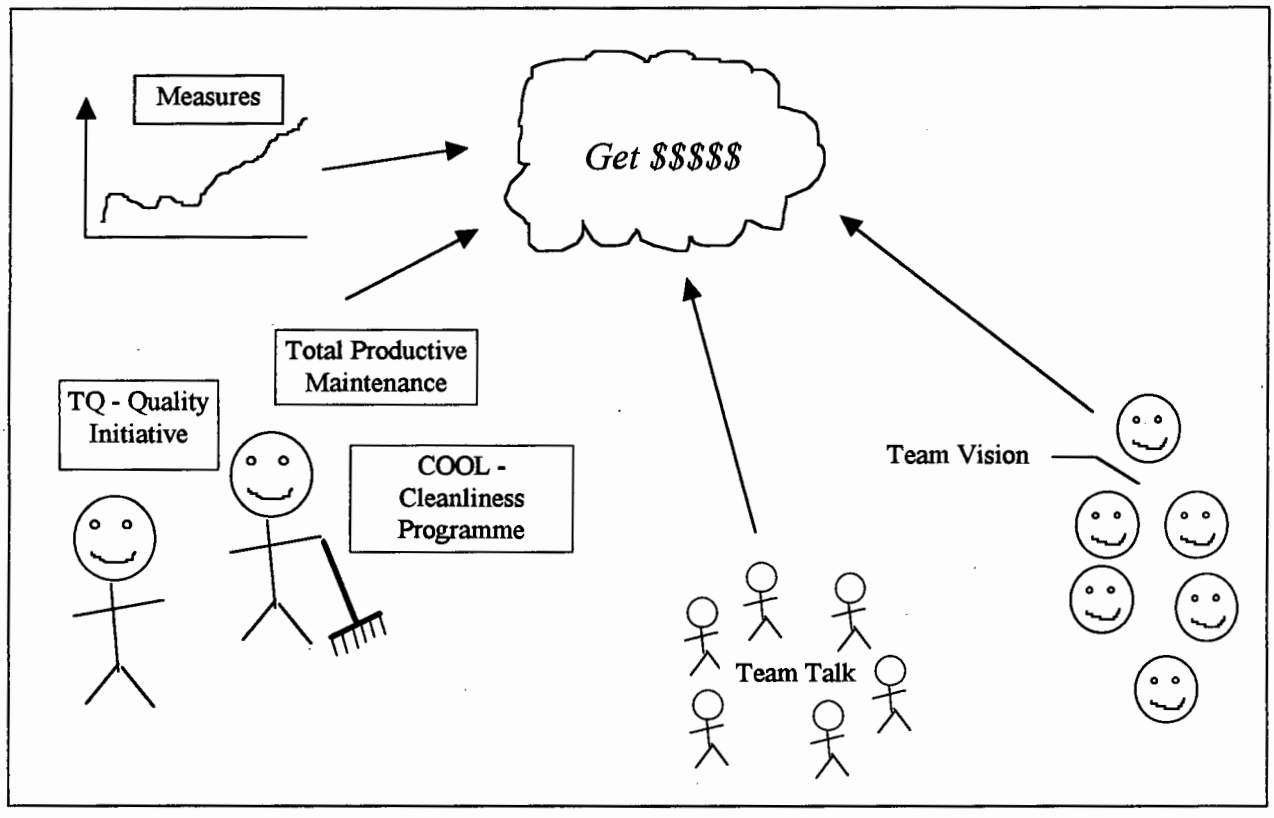
Working at Company XYZ can be seen as trying to follow the management (who are in a steam boat) in a rowing boat. Each time the managers change, the course of the steam boat changes. For the people who have been in the Company for a long time it becomes increasingly difficult to keep up with the frequent changes.



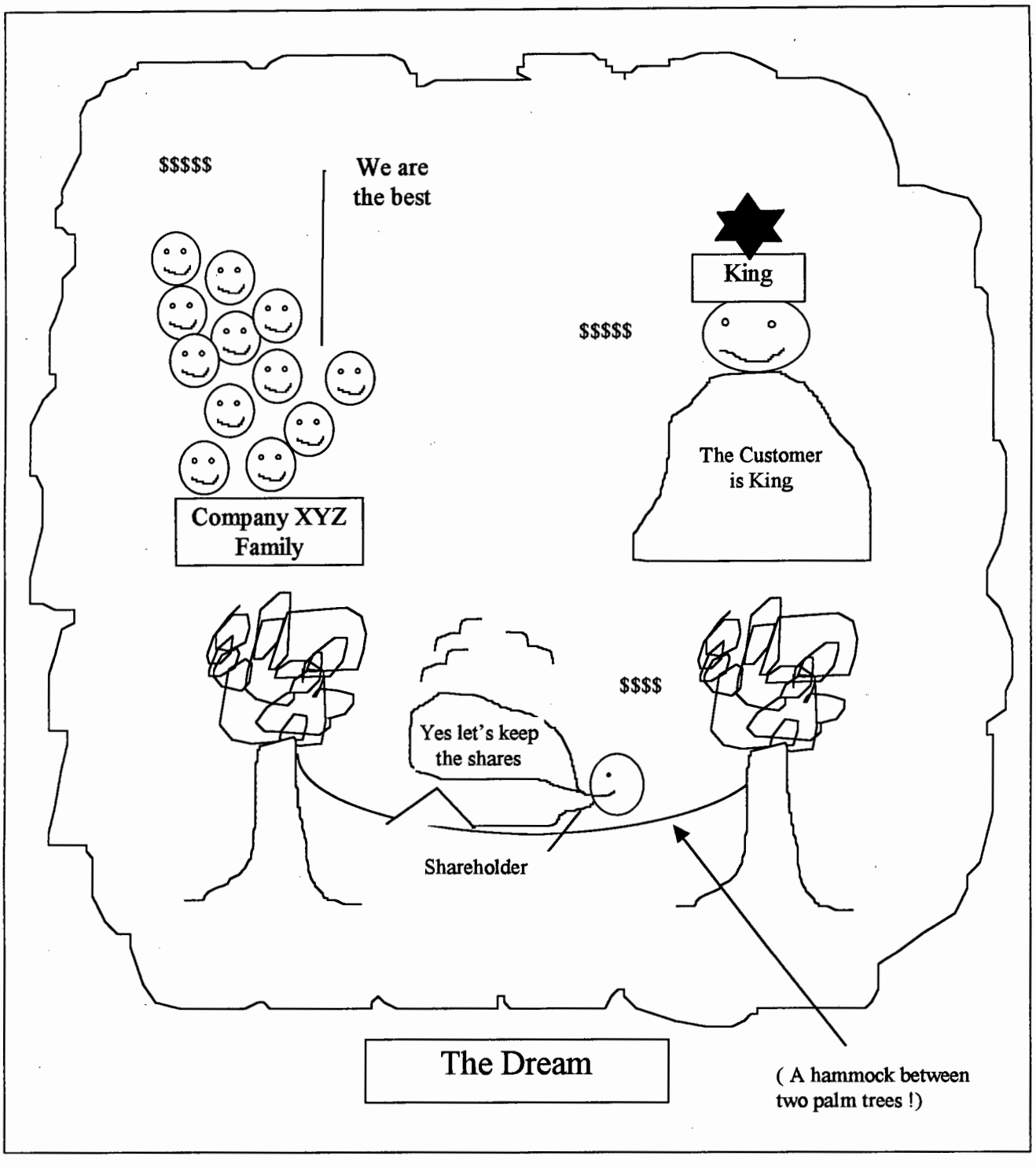
Three years ago there was a step change in the road that Company XYZ was driving along. Still, however the management should be trying to 'steal our hearts'. ('Steal our hearts' is a phrase translated from Afrikaans).



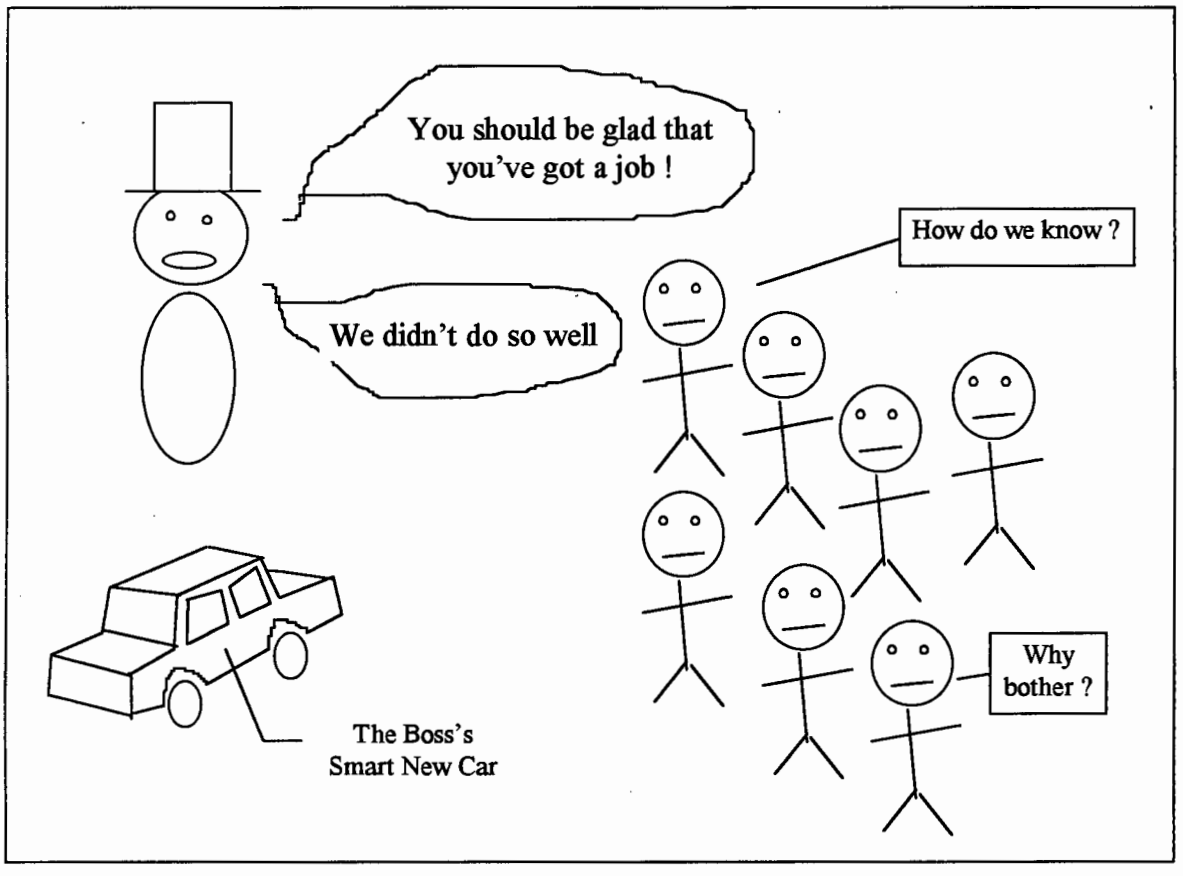
The Company should have a family atmosphere where everyone knows and is concerned about everyone else.



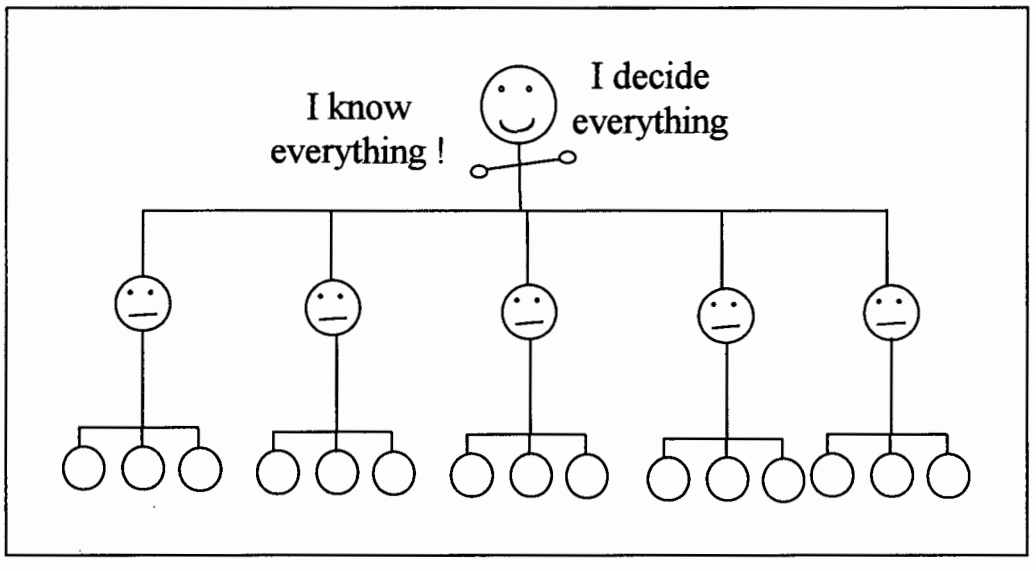
All the new initiatives that are going on should mean more cash at the end of the day.



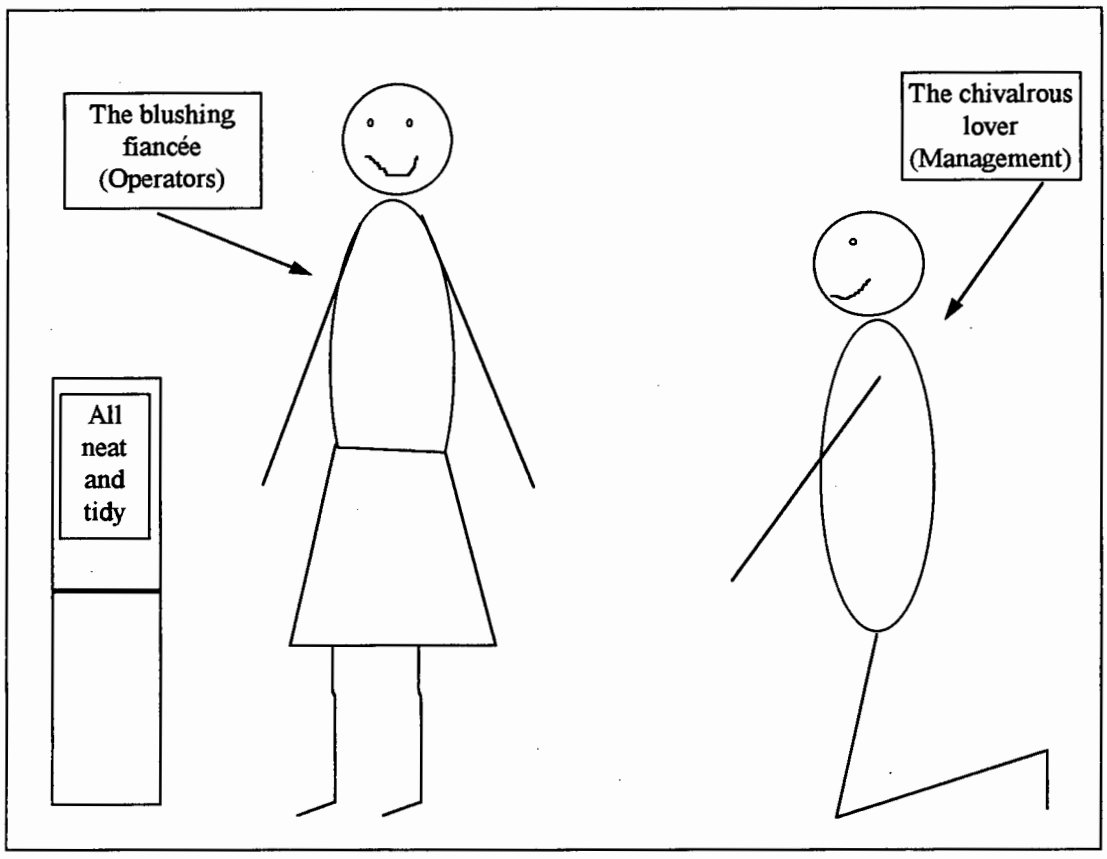
The dream, in which the customer is King, the shareholders are happy and so are all the employees.



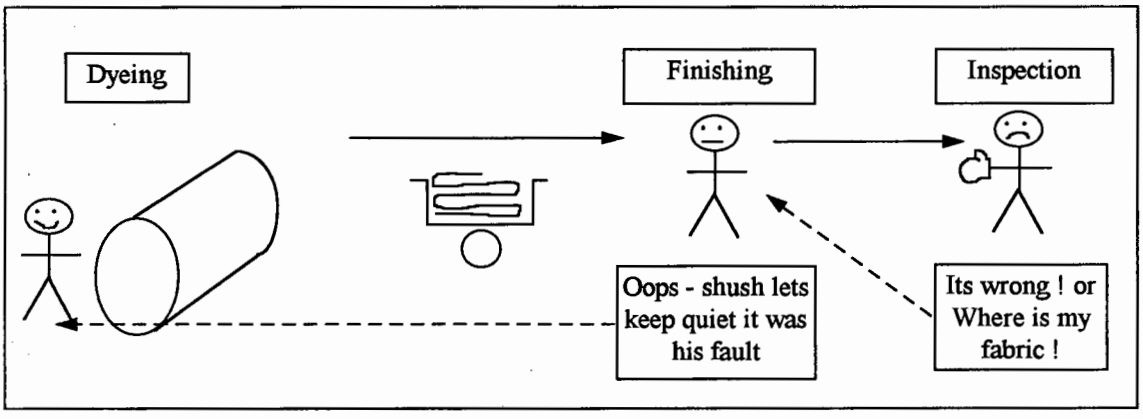
Always bad news and yet the managers get the newest cars. Do we believe what they say or give up hope altogether ?



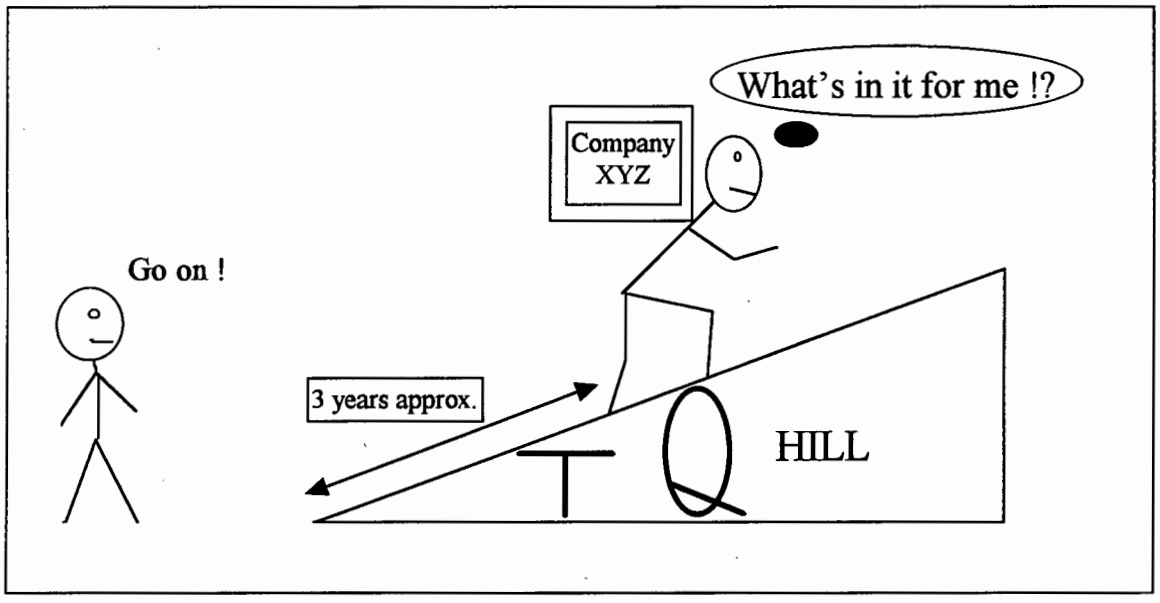
The person at the top of the tree is the big I am.



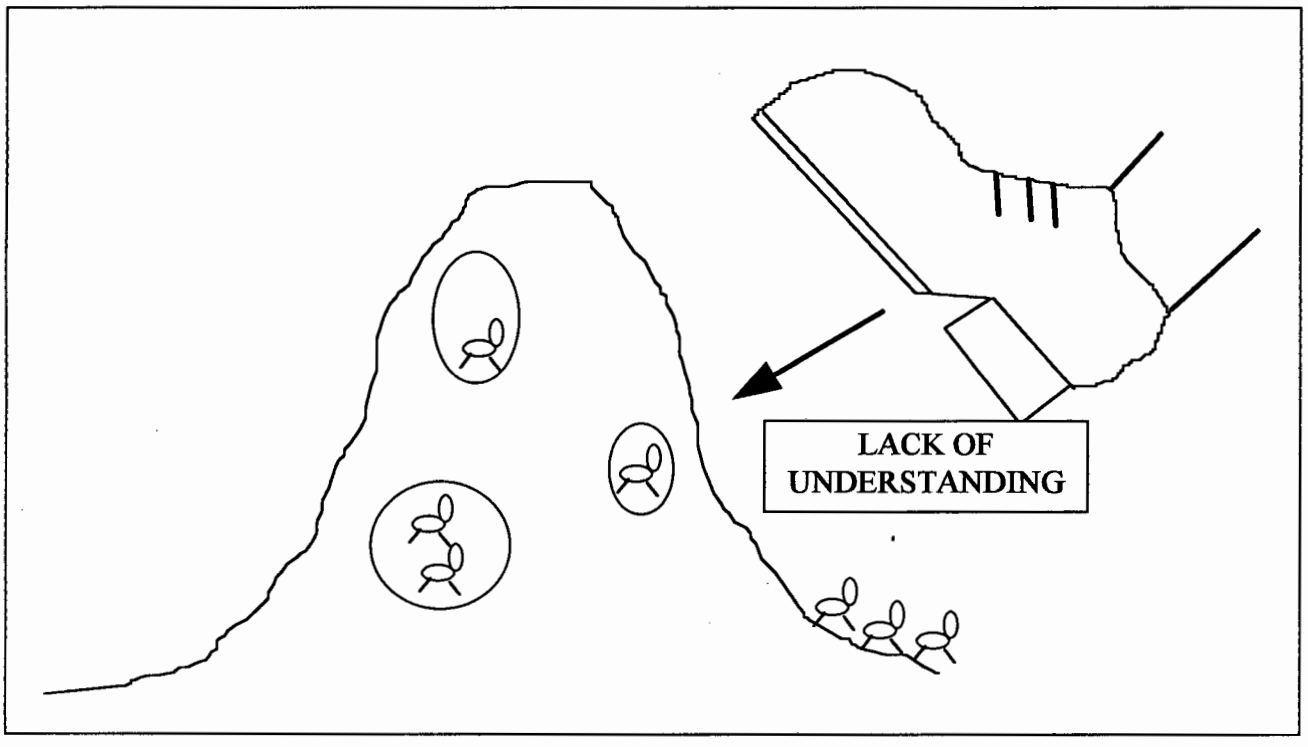
Management should be trying to woo the Operators as a lover would woo his fiancee. Everywhere should be neat and tidy.



The problems of picking up errors after the product has left the department in which they originated.



What do we (the operators) get for all the efforts in total quality etc. ?



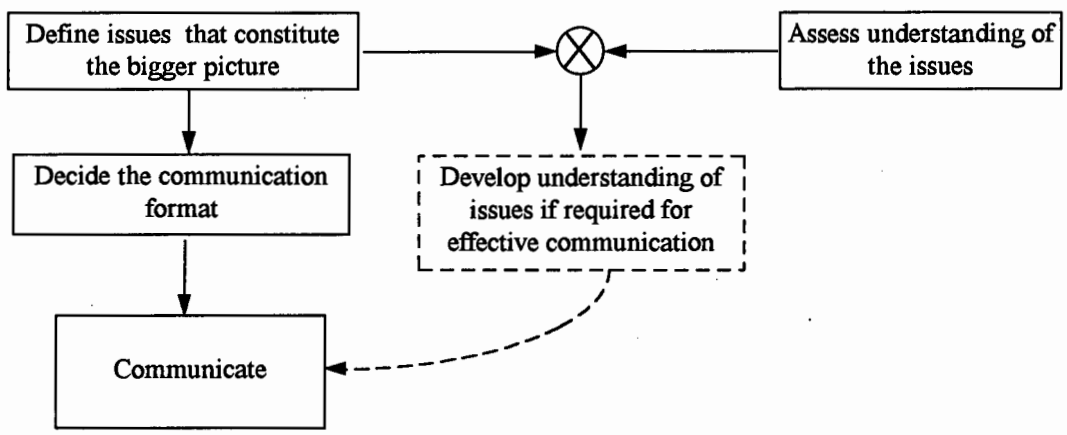
The ants in their anthill stepped on through a lack of understanding.

4.4. Appendix 4 : The 'Crude' Group 1 Models from Stage 4

Definition : A system to communicate the 'bigger picture' to employees.

Transformation : Employees without knowledge/understanding of the 'bigger picture' ⟹ Employees with knowledge/understanding of the 'bigger picture'

B H	All employees Those with connections to glean bigger picture (information is power?)
A	Management, HR
W	Knowledge of the bigger picture will allow better decisions making and realism.
O	Managers in contact with specifics of the bigger picture
E	Understanding of the information to be transferred



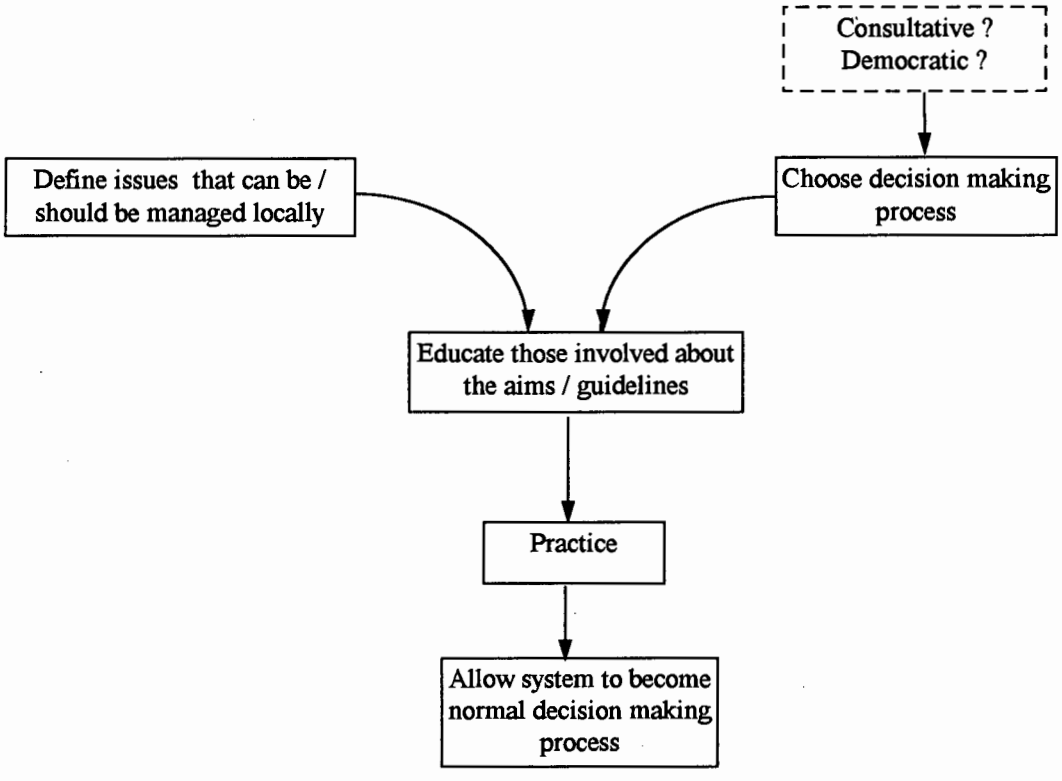
Measures of performance :

Effectiveness : Do the issues constitute the bigger picture ?
Efficiency : Are the issues that are communicated understood ?
Efficacy : Can the system define the bigger picture ? Can the system communicate efficiently ?

Definition : A system to enable involvement in local decision making.

Transformation : Employees without involvement in decisions that effect them ⇨ Employees involved in decisions that effect them

B H	All employees Managers
A	All employees
W	Involvement in local decision making will promote ownership and responsibility which are desirable
O	Management
E	Understanding of the decision making process and wider context within which the impact of the decisions will be felt

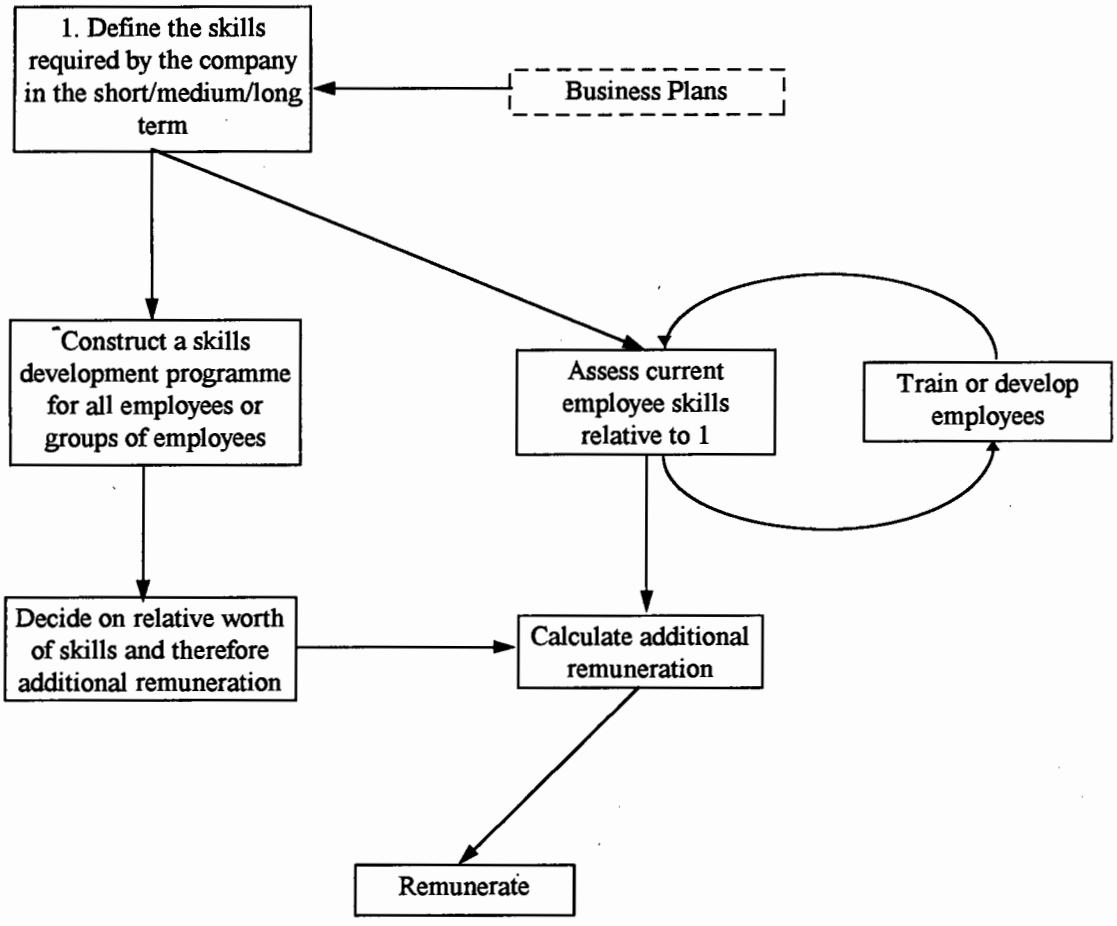


Measures of performance :

Effectiveness : does the system enable involvement ?
Efficiency : Are decisions made according to the system ?
Efficacy : Does the system understand the decision making process ?

Definition : *A system to remunerate employees in accordance with the skills required for the long term success of the company.*

Transformation : Employees paid using historical system ⇨ Employees paid according to the skills they acquire



Measures of performance :

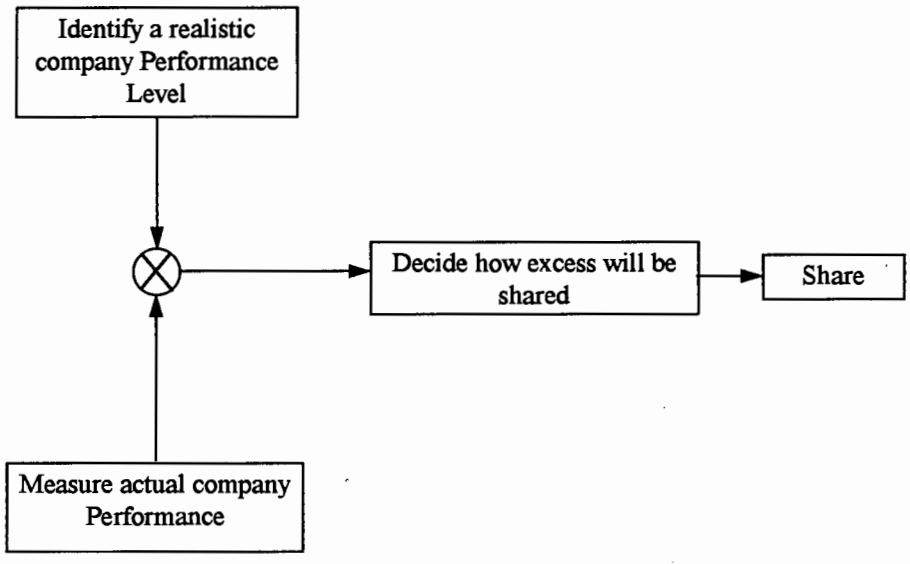
Effectiveness : Do we have the skills we require in the short/medium/long term?

Efficiency : Are people paid the correct amount according to their skills ?

Efficacy : Do we have the ability to convert business plans into skills requirements? Can we assess skills ? Can we construct a development programme ?

Definition : A system to remunerate employees in accordance with the performance of the company

Transformation : Employees paid using historical system ⟹ Employees paid according to the performance of the company



Measures of performance :

Effectiveness : Do we exceed the targets for company performance ?

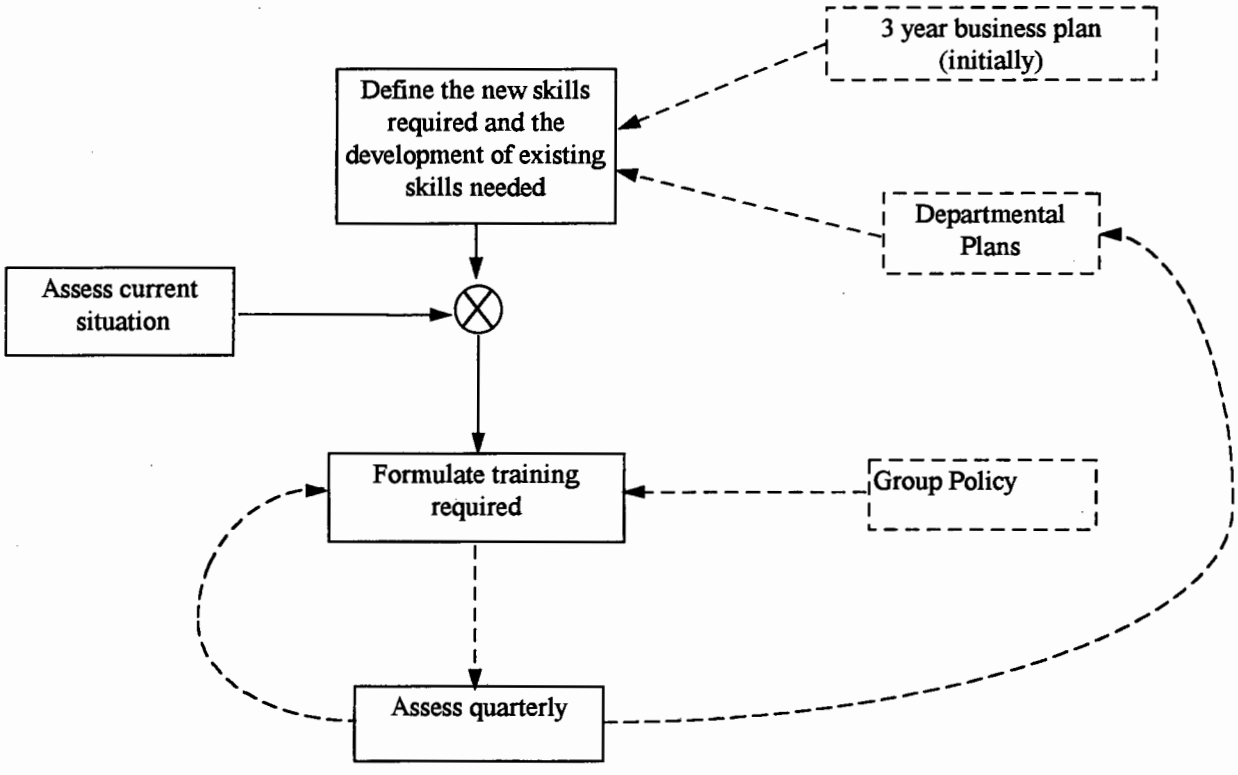
Efficiency : Are people paid the correct amount

Efficacy : Do we have the ability to set a performance target ? Can we measure company performance?

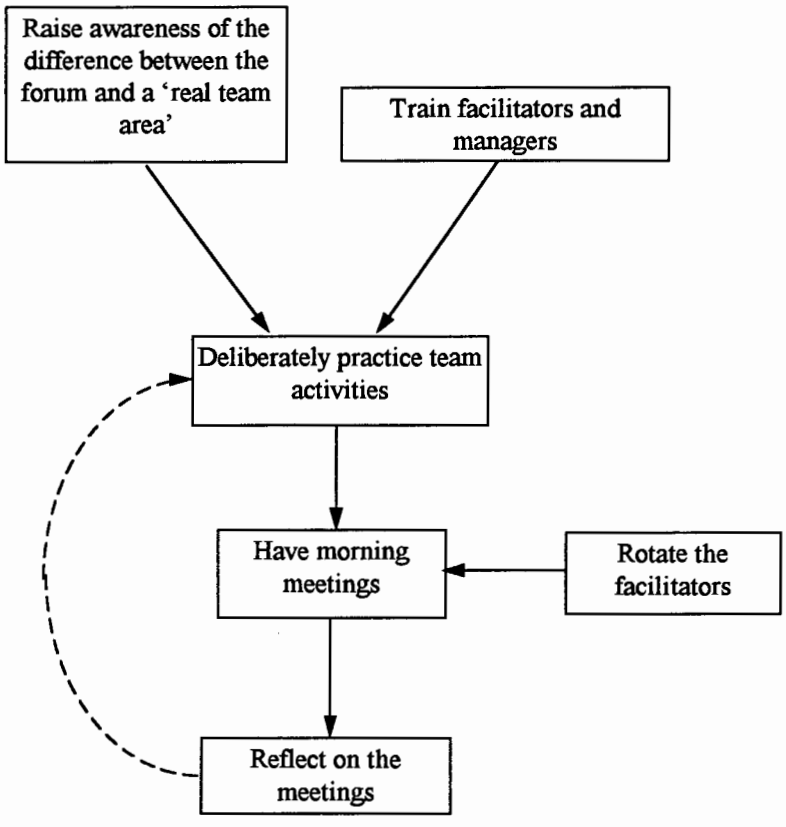
Definition *A system to develop or acquire the skills/education/training that the company will need to fulfil its business plan in the short, medium and long term.*

Transformation : Employees with 'random' skills ⇒ Employees with specific skills that will help the organisation attain its vision

B H	company, customers Those who do not wish to gain the skills which will help the company
A	HR department, line managers
W	Relevant skills will benefit the organisation
O	GM, MD
E	The ability to acquire the required skills. A budget for training. Profitability of the company for the budget to exist.



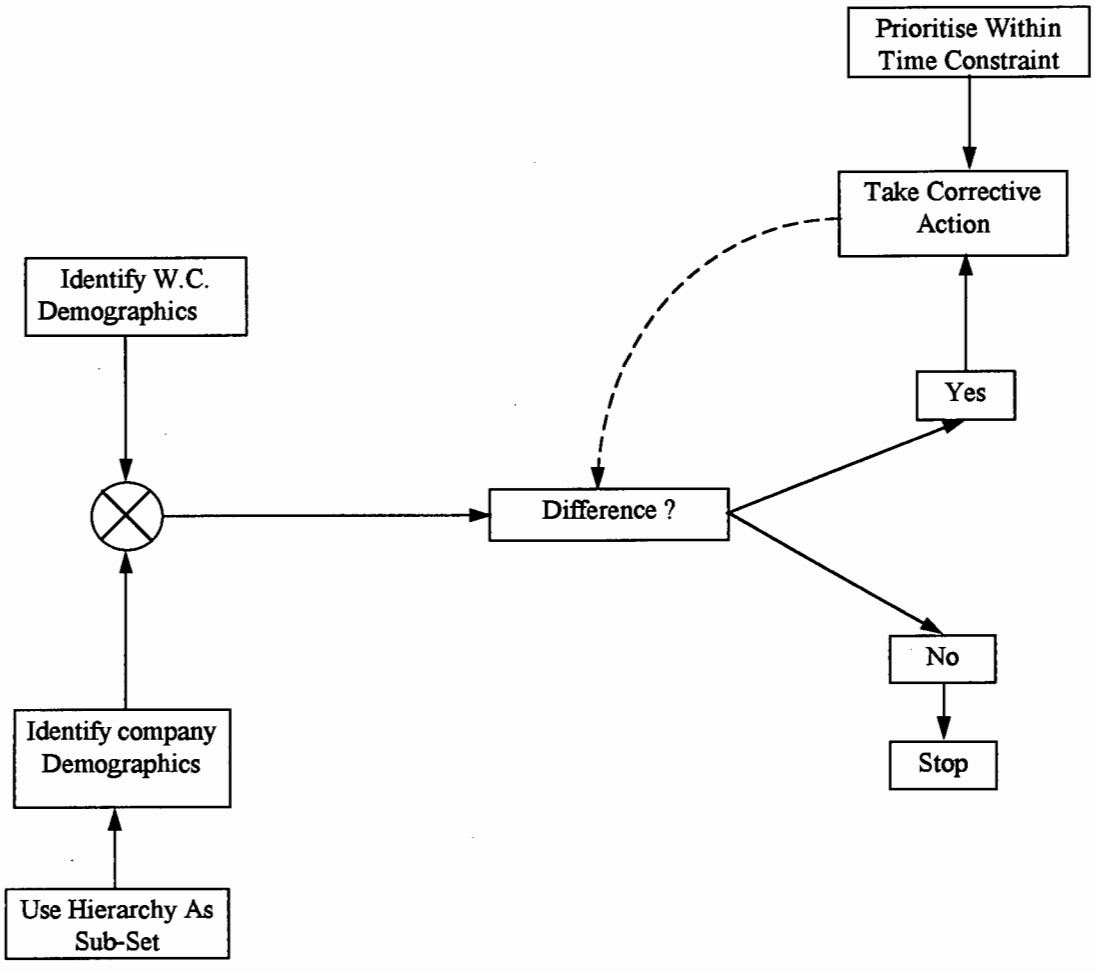
Definition *A system to transform the current 'communication forums' to 'team areas'*



Definition : a system to transform the demographics of the company to fit that of the Western Cape

Transformation : company not representative of Western Cape Demographics ⟹ Representative

Additional constraints : Must include Entire company Structure
Must Complete Within time constraint



Measures of performance :

Effectiveness : How much movement towards the target has been made ?
Efficiency : Is corrective action being taken ?
Efficacy : Can the system identify the WC demographics and company demographics ? Can the system take corrective action ?

Definition : a system to identify opportunities for those disadvantaged by apartheid and ensure the opportunities are taken.

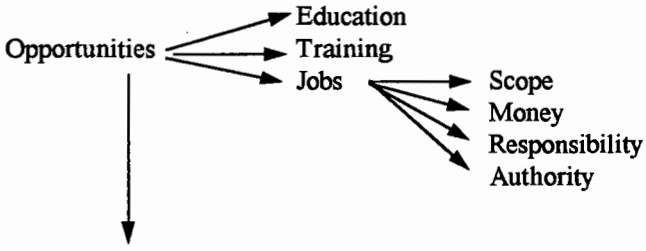
Transformation : No Opportunities For Disadvantaged ⟹ Opportunities (within budget)

Definition of disadvantaged : Actual discrimination or generalised discrimination ?

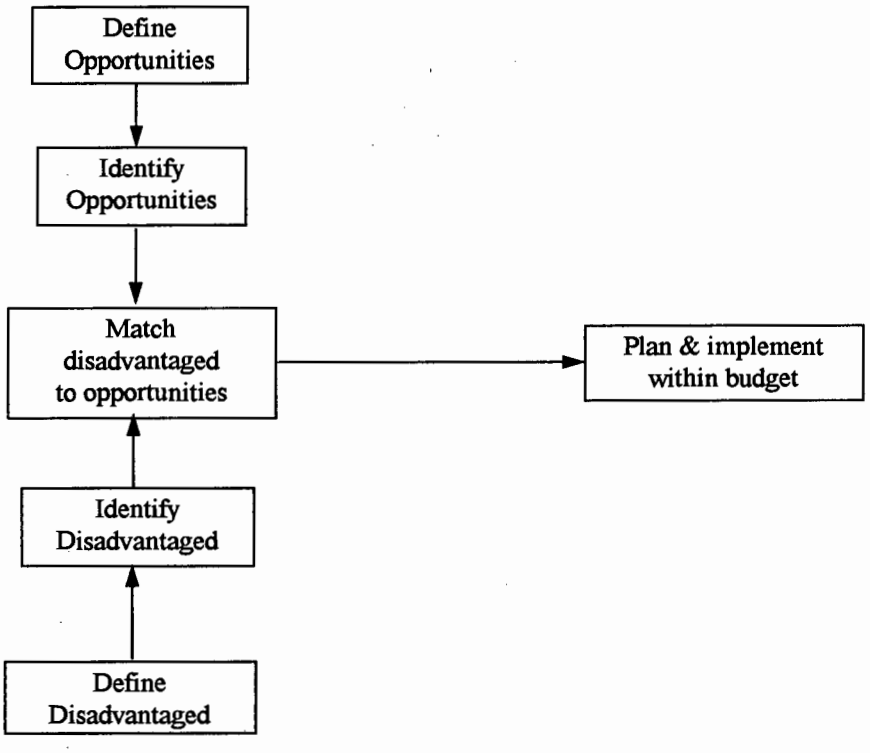
B H	Disadvantaged Non Disadvantages, Organisation
A	Top Management, Line Management, Human Resources
W	Legislation, Moral Duty, Equality
O	Managing Director, Line Managers, Operators
E	Pool of people, legislation

Company View

Union set 'job' for operators thus different for managers



Employees More Marketable



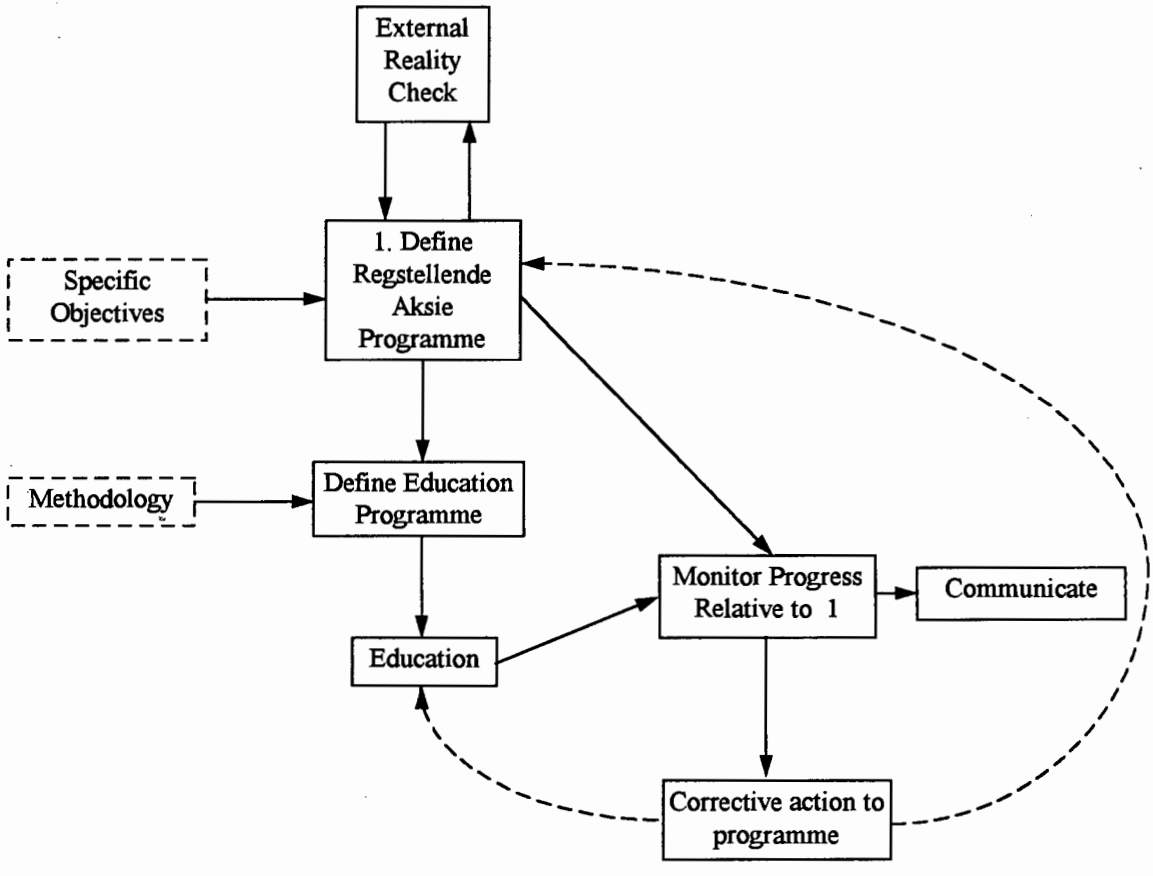
Measures of performance :

Effectiveness : Has the perception of no opportunities for the disadvantaged gone?
Efficiency : Are the disadvantaged getting opportunities
Efficacy : Can the system define identify and match disadvantaged to opportunities ?

Definition : a system to inform employees about Affirmative Action and to keep them in touch with the Opportunities available and those people having taken them.

Transformation : Uneducated about affirmative action ⇒ Educated and in touch (communication of actuality of AA)

B H	Disadvantaged, company Non-Disadvantaged
A	HR who then educate line managers, but continue with core communication
W	Important to know about intervention
O	Managing Director, Operators (? - depends on method of communication)
E	Time, Communication Systems

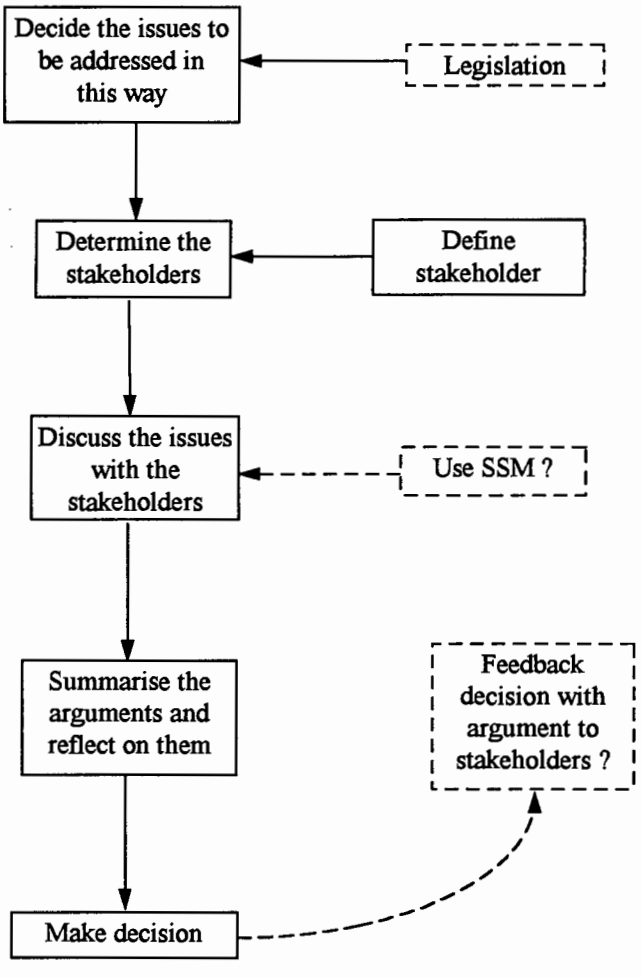


Definition *A system to transform current autocratic management decision making into a consultative process*

Transformation : Management making all decisions autocratically ⇒ A consultative decision making process

B H	Stakeholders, company Managers
A	Stakeholders
W	Consultative decision making is better as it deliberately surfaces divergent views on specific issues
O	Management ? Legislation
E	A basic understanding of the issues

<u>For a specific issue :</u>

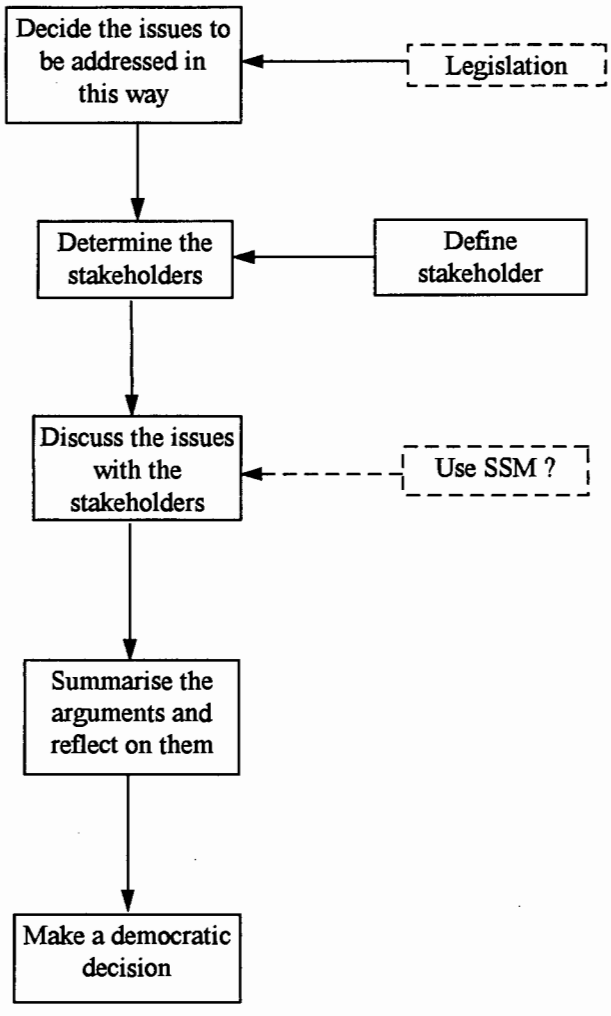


Definition *A system to transform current autocratic management decision making into a democratic process*

Transformation : Management making all decisions autocratically ⇒ A democratic decision making process

B H	Stakeholders, company Managers
A	Stakeholders
W	Democratic decision is the fairest way to make decisions as those affected by the decision make the decision
O	Management ? Legislation
E	A basic understanding of the issues

<u>For a specific issue :</u>



4.5. Appendix 5 : Developing an SSM Facilitation Capability

Whilst not a central concern of this dissertation, it was agreed that one member of the HR2000 committee should become the resident expert on SSM, so that when the author left, the company would have an ability to repeat the process if required.

This appendix will outline how the facilitation skills and knowledge of SSM were transferred.

(i) She attended the author's presentation to line management introducing the project and SSM.

(ii) Group 1 was introduced to the methodology in more detail.

(iii) She was given a document that was written as a part of this report, introducing SSM.

(iv) The issues to be addressed in a specific session with Group 1 were always discussed with her beforehand.

(v) The lady was studying on the same programme at the University of Cape Town, starting one year after the author. She had been introduced to SSM as part of the course.

(vi) This year, 1996, she will also do a dissertation using SSM. The project will centre on the training/development project described in Section 2.5.6.

4.6. Appendix 6 : Details of the Time Spent on the Project

Details of the time spent on the project is shown below.

Month	*Activity*	*Time taken*
February 1995	Initial preparation	2 days per week
March	Initial preparation	2 days per week
April	Initial preparation	2 day per week
May	Researching SSM	2 days per week
June	Researching SSM	2 days per week
July	Initial contact with the company	6 days in month
August	Meetings with Company once every two weeks + preparation	2 days per week
September	Meetings	2 days per week
October	Meetings	2 days per week
November	Meetings	2 days per week
December	Meetings	2 days per week
January 1996	Write first draft	3 weeks
February	Modify for second draft	2 weeks
March	Modify for third draft	2 weeks
April	Deadline for completion	

Approximate total hours spent on the project 1000 hours.

5. REFERENCES

[1] Kohn, T. (1962) The Structure of Scientific Revolutions. Chicago University Press.
[2] Popper, K. R. (1983) Realism and the aim of science from the "Postscript to the logic of scientific discovery". Hutchinson, London.
[3] Peirce, C.S.. The Fixation of Belief - other details unknown.
[4] Beer, S. (1966) Decision and control. Page 17. Wiley.
[5] Smith, C.S.. (1995) Towards a Peircean Framework for Organisational Development. A Teleological Approach. Page 81. (A dissertation presented for the degree of Master of Philosophy at the University of Cape Town).
[6] Beer, S. (1966) Decision and control. Page 26. Wiley.
[7] Peirce, C.S.. (1957) Essays in the Philosophy of Science. The Bobbs-Merril Company Inc.. Page 20.
[8] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 25. Fordham University Press, New York.
[9] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 25. Fordham University Press, New York.
[10] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 27 . Fordham University Press, New York.
[11] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 26. Fordham University Press, New York.
[12]Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 30 . Fordham University Press, New York.
[13]Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 35 . Fordham University Press, New York.
[14] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 27 . Fordham University Press, New York.
[15]Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 65 . Fordham University Press, New York.
[16] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 60 Fordham University Press, New York.
[17] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 61. Fordham University Press, New York.
[18] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 71 . Fordham University Press, New York.
[19] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 71 . Fordham University Press, New York.
[20] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 75 . Fordham University Press, New York.
[21]Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 75 . Fordham University Press, New York.
[22] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 89. Fordham University Press, New York.
[23] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 90. Fordham University Press, New York.
[24] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 89. Fordham University Press, New York.
[25]Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 81 . Fordham University Press, New York.
[26]Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 94 . Fordham University Press, New York.
[27] Handy, C.. (1990) Age of Unreason. Page 45. Arrow Business Books.
[28] Checkland, P. (1981) Systems Thinking, Systems Practice. Wiley. Part 1.
[29] Checkland, P. (1981) Systems Thinking, Systems Practice. Wiley. Part 1.
[30] Checkland, P. (1981) Systems Thinking, Systems Practice. Wiley.
[31] Patching, D. (1990) Practical Soft Systems Analysis. Pitman Publishing.
[32] Wilson, B. (1984) Systems : Concepts, Methodologies and Applications. Wiley, New York.
[33] Checkland, P. and Scholes, J. (1990) Soft Systems Methodology in Action. John Wiley.

[34] Rosenhead, J. (Editor). (1989) Rational Analysis for a Problematic World. Page 274. John Wiley & Sons.
[35] Rosenhead, J. (Editor). (1989) Rational Analysis for a Problematic World. Page 274. John Wiley & Sons.
[36] Rosenhead, J. (Editor). (1989) Rational Analysis for a Problematic World. Page 275. John Wiley & Sons.
[37] Rosenhead, J. (Editor). (1989) Rational Analysis for a Problematic World. Page 280. John Wiley & Sons.
[38] Strümpfer, J.P. Systems Approach Questions for Problematical Situations. Institute for Futures Research.
[39] Morgan, G. (1986) Images of Organization. Sage Publications.
[40] Flood, R.L. and Jackson, M.C. (1991) Creative Problem Solving. Pages 87 - 117. Wiley.
[41] Stolovitch H.D. & Keeps E.J. (editors) (1992) Handbook of human performance technology. Jossey-Bass Inc., San Francisco.
[42] Miller, I. E. (1917) The Psychology of Thinking. Macmillan, New York,.
[43] Flood R.L. and Jackson M.C. (1991) Creative Problem Solving : Total Systems Intervention. Wiley.
[44] Davies, L.J.. (1989) The Cultural Aspects of Intervention with Soft Systems Methodology. (A doctoral thesis)
[45] Checkland, P. and Scholes, J. (1990) Soft Systems Methodology in Action, Page 22. John Wiley.
[46] Checkland, P. (1981) Systems Thinking, Systems Practice. Wiley.
[47] Checkland, P. (1981) Systems Thinking, Systems Practice. Wiley. Page 261.
[48] Churchman, C. W. (1971) The Design of Inquiring Systems : basic concepts of systems and organization. Basic Books. Page 108.
[49] Churchman, C. W. (1971) The Design of Inquiring Systems : basic concepts of systems and organization. Basic Books. Page 110.
[50] Churchman, C. W. (1971) The Design of Inquiring Systems : basic concepts of systems and organization. Basic Books. Page 114.
[51] Churchman, C. W. (1971) The Design of Inquiring Systems : basic concepts of systems and organization. Basic Books. Page 113.
[52] Churchman, C. W. (1971) The Design of Inquiring Systems : basic concepts of systems and organization. Basic Books. Page 105.
[53] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 89. Fordham University Press, New York.
[54] Reilly, F.E.. (1970) Charles Peirce's Theory of Scientific Method, Page 90. Fordham University Press, New York.
[55] Flood, R.L. and Jackson, M.C. (1991) Creative Problem Solving. Wiley.
[56] Meadows, DH. (1980) The Unavoidable Apriori. (Taken from : Elements of the System Dynamics Method) Productivity Press.
[57] Checkland, P.B. (1979b)
[58] Strümpfer, J.P. Systems Approach Questions for Problematical Situations, Institute for Futures Research.
[59] Ministry of Labour Notice (Notice 97, 1995) Draft Negotiating Document in the form of Labour Relations Bill. (Draft commentary by Chipeya, H.M. et al on Chapter 5)
[60] Hoebeke, L. (1994) Making Work Systems Better. John Wiley.
[61] Owen, H.. Open Space Technology. Journal of Applied Behavioural Science. Volume 24, #4, December 1992.
[62] Middleton, P.W.W. & Ryan T.B. (1996) The Contribution of SSM to Effective Enquiry. (A working paper - School of Engineering Management, University of Cape Town.)
[63] Checkland, P.. (1981) Systems Thinking, Systems Practice. Wiley. Appendix 1.
[64] Checkland, P.. (1981) Systems Thinking, Systems Practice. Wiley. Page 176.
[65] Checkland, P.. (1981) Systems Thinking, Systems Practice. Wiley. Page 176.
[66] Flood, R.L. & Jackson, M.C.. (1991) Creative Problem Solving. Total Systems Intervention. Wiley. Pages 87 - 117.
[67] Checkland, P.. (1981) Systems Thinking, Systems Practice. Wiley. Page 176.
[68] Checkland, P. and Scholes, J.. (1990) Soft Systems Methodology in Action. Wiley. Page 280.