

Developing a Soft Systems Solution for Enhancing and Managing Change in Organisations

**A thesis submitted in fulfilment of the requirements for the degree of
Doctor of Philosophy**

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of the work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and ethics procedures and guidelines have been followed.

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John T Young

Date:

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Table of Contents

List of Figures

List of Tables

List of Abbreviations

List of Publications

Abstract

Page

Chapter 1 Introduction

1.1	Introduction	1
1.2	Background to the investigation	1
1.3	Appropriateness of the research design	4
1.4	Research objective and questions	6
1.5	Scope of the research	7
1.6	Implications for organisations	7
1.7	Structure of the thesis	8

Part 1 Literature Review and Methodology

Chapter 2 Systems concepts and the application of Soft Systems Methodology

2.1	Introduction	10
2.2	Systems complexity	10
2.3	Organisations as systems	11
2.4	Socio-technical systems theory	14
2.5	Organisations as socio-technical systems	15
2.6	Systems science as a field of enquiry into the social science	16
2.7	The identification of social capital	20
2.8	Modelling of systems transformation	20
2.9	Experiential learning as a systems change tool	21
2.10	SSM applied to complex human interaction	21
2.11	Current research on extended SSM applications	23
2.12	Summary	25

Chapter 3 Soft Systems Methodology

3.1	Introduction	27
3.2	The principles of Soft Systems Methodology	27
3.3	Soft Systems Methodology as a seven step process	29
3.4	Critique of Soft Systems Methodology	39
3.5	Summary	40

Chapter 4 Organisational Change

4.1	Introduction	41
4.2	Traditional change theory	41
4.3	Contemporary change strategies	45
4.4	Optimising change	46
4.5	Change levers	47
4.6	Systems approach to change	49
4.7	Summary	50

Chapter 5 Research Methodology

5.1	Introduction	51
5.2	Research paradigm	51
5.3	Choice of Soft Systems Methodology	52
5.4	Research design	53
5.5	Research assumptions	55
5.6	The application of case studies	57
5.7	Data analysis approach	59
5.8	Data gathering by interviews	60
5.9	Reliability of data	62
5.10	Validity of data	62
5.11	Representativeness of data	63
5.12	Development of qualitative models	63
5.13	Ethical considerations	64
5.14	Limitations of study	66
5.15	Summary	66

Part II Case Studies and Results

Chapter 6 Case Studies

6.1	Introduction	69
6.2	Case No. 1 - A Municipal Authority	70
6.3	Case No. 2 - Award Restructuring in the Metals Industry	86
6.4	Case No. 3 - A Machinery Dealer	103
6.5	Case No. 4 - A Clothing Manufacturer's Logistics	115
6.6	Case No. 5 - A Secondary College Enrolment System	128
6.7	Summary	140

Chapter 7 Discussion of Results and Analysis

7.1	Introduction	141
7.2	Case No. 1 summary of results	143
7.3	Case No. 2 summary of results	148
7.4	Case No. 3 summary of results	153
7.5	Case No. 4 summary of results	156
7.6	Case No. 5 summary of results	162
7.7	Summary of key findings	166

Chapter 8	Conclusions	
8.1	Introduction	169
8.2	Conclusions	169
8.3	Contribution to learning	170
8.4	Limitations and constraints	171
8.5	Practical Implications	172
8.6	Opportunities for further research	172
	References	174
	Appendix A	178
	Appendix B	178
	Appendix C	186

List of Figures

Figure No.	Title	Page
2.1	A system based framework of organizations	13
2.2	The shape of the systems movement, indicating the progressive development of particular theoretical branches	19
2.3	System of systems methodology matrix	22
3.1	The process of soft systems methodology	29
3.2	The basic iterative shape of SSM	30
3.3	Exploring and expressing the situation	31
3.4	Characteristics of a rich picture	32
3.5	A Root Definition, CATWOE and pictorial representation of a fence painting system	35
3.6	Dependency diagram	36
3.7	The matrix as a technique for comparing a conceptual model with a real-world action	37
5.1	A basic conceptualisation of intellectual work	53
5.2	Flow diagram of data analysis process	60
6.1	The soft systems analysis approach	75
6.2	Rich picture of the problem situation – expressed: amalgamated local government	76
6.3	Conceptual model of the problem – structured	80
6.4	Rich picture of the problem situation – expressed: award restructuring	90
6.5	Conceptual model of award restructuring – structured	94
6.6	Rich picture of the problem situation – expressed: a machinery dealer in trouble	105
6.7	Conceptual model of a dealership – structured	108
6.8	Rich picture of the problem situation – expressed: logistics of an industrial clothing manufacturer	118
6.9	Conceptual model of storage and distribution system – structured	121
6.10	Rich picture of the problem situation – expressed: college enrolment problem	130
6.11	Conceptual model of enrolment system – structured	134

List of Tables

Table No.	Title	Page
1.1	Questions to be answered by the research	6
2.1	Principles underlying the soft systems approach	23
2.2	Summary of literature review	25
4.1	Contemporary approaches to change management	45
5.1	Relevant situations for different research strategies	57
5.2	Process of building theory from case study research	58
5.3	Case study protocol	62
5.4	Ethical standards for researcher-respondent relationships	65
5.5	Summary of research design	67
6.1	Discussion questions	69
6.2	Statement of root definition – Case No. 1	80
6.3	Elements of the conceptual model – Case No. 1	81
6.4	SSM comparison stage – Case No. 1	82
6.5	Statement of root definition – Case No. 2	94
6.6	Elements of the conceptual model – Case No. 2	95
6.7	SSM comparison stage – Case No. 2	96
6.8	Statement of root definition – Case No. 3	107
6.9	Elements of the conceptual model – Case No. 3	109
6.10	SSM comparison stage – Case No. 3	110
6.11	Statement of root definition – Case No. 4	120
6.12	Elements of the conceptual model – Case No. 4	122
6.13	SSM comparison stage – Case No. 4	123
6.14	Statement of root definition – Case No. 5	133
6.15	Elements of the conceptual model – Case No. 5	135
6.16	SSM comparison stage – Case No. 5	136
7.1	Evaluation of SSM tools	141
7.2	Research questions	142
7.3	Root definitions – Case No. 1	143
7.4	Elements of the conceptual model – Case No. 1	143
7.5	Root definitions – Case No. 2	148
7.6	Elements of the conceptual model – Case No. 2	148

List of Tables - Continued

7.7	Root definitions – Case No. 3	153
7.8	Elements of the conceptual model – Case No. 3	153
7.9	Root definitions – Case No. 4	157
7.10	Elements of the conceptual model – Case No. 4	158
7.11	Root definitions – Case No. 5	162
7.12	Elements of the conceptual model – Case No. 5	162

List of Abbreviations

CATWOE	Clients, Actors, Transformation, World-view, Owners, Environment
CEO	Chief Executive Officer
CNC	Computer Numerical Control
IT	Information Technology
MTI	Metal Trades Industry
NHS	National Health Service (UK)
OH&S	Occupational Health & Safety
RFID	Radio Frequency Identification
SKU	Stock Keeping Unit
SSM	Soft Systems Methodology
SWOT	Strengths, Weaknesses, Opportunities, Threats
TCF	Textile Clothing and Footwear
TQM	Total Quality Management

List of Publications

Young, J. T. (2008) Applying Soft Systems Methodology to Leveraging Change in Organisations. Submitted to *Systems Engineering: the Journal of The International Council on Systems Engineering*, for review and publication May 2009. Reference file No. 090106

Abstract

This thesis addresses problems associated with organisational change and seeks to provide insights into the application of soft systems methodology to identify change levers that can facilitate change. Businesses face change drivers with ever increasing pressure and frequency from economic, social and environmental sources. Most change processes involve cultural change that takes time and are fraught with barriers and social resistance. A process that can facilitate timely change and enables the establishment of a mutual accommodation in the hearts and minds of the participants can be of significant value.

The identification of points of high yield of experience and learning characterised as change levers, can facilitate this timely and supportive approach to change.

Soft systems methodology has been used extensively in researching complex and messy problems in poorly defined social systems where previously unseen issues and values have been identified. It is used to facilitate a shared experience, which leads to understanding among the stakeholders. However, a gap exists in the application of soft systems methodology in identifying change levers. This research is used to address and identify these change levers.

A qualitative research methodology is adopted using interviews of managers and participants in a range of organisations either undergoing change or where change has recently taken place. Issues identified from the research are presented graphically in models that help to identify potential points of leverage. The research also offered an opportunity to apply soft systems methodology to a situation where coercive change was evident. Interpretive analysis is applied to the findings to draw conclusions.

The research demonstrates that a full exploration of underlying resistive elements can be used to reach a mutual accommodation of other participants' worldview, so leveraging the change process. By involving the participants in the creative development of a conceptual future also optimises the transformation process by introducing a new paradigm of engagement in the change process.

Chapter 1: Introduction

1.1 Introduction

This chapter introduces the problem context and the associated research questions. It discusses the significance of the research and identifies the setting of the study. An argument for the selection of soft systems as a methodology is presented and the key terms are defined. The implications of the study for learning organisations to improve their change management outcomes are noted. The chapter concludes with a description of the structure of the thesis.

1.2 Background to the Research

Industries in Australia and elsewhere are experiencing a period of immense social change. Many labour oriented jobs are being mechanised and organisations are rationalising to introduce economic and structural efficiencies. With the convergence of technology the demand for many traditional skills has declined. Large organisations such as government utilities are corporatising, then privatising, and in some cases floated on the stock market, with the consequential need to re-engineer the culture of the organisation to meet both the new market economics and the changed expectations of the consumers.

Recently in Australia, a number of organisations have moved from being public utilities to customer service and market driven organisations. The process of changing culture and understanding the new product and service values is complex, messy, slow and difficult to manage. Kotter (1995) found that many of the corporate change effort by commercial organisations were only partially successful and some were utter failures. Significant drivers that are forcing these changes are international competitiveness, the deregulation of the communications and utility industries, the ascending expectations of consumers in service delivery and quality, and the political climate conducive to introducing these changes.

For Australia to successfully negotiate the present and future decade of social change in industry with economic rationalisation, rapidly converging technology and the shift to a more customer service driven economy, an appropriate interventionist action for managing change is required. It is most important that management have access to a process, which can confidently be applied to re-engineering the beliefs and values of organisations without going through a wasteful process of trial and error. Most change processes involve cultural change that takes time and is fraught with barriers and social resistance.

A gap exists in predicting the most appropriate interventionist action for managing change. A process that can facilitate timely change and enable the establishment of consensus in the hearts and minds of the participants can be of significant value. The identification of points of high yield of experience and learning, described as change levers, can facilitate this timely and supportive approach to change. A progressive process would necessarily be inclusive of the culture of the end users, therefore a holistic approach, such as soft systems methodology, is called for.

Soft systems methodology has been used extensively in researching complex and messy problems in social settings, where unseen issues and values have been identified. These raised values are then used to facilitate a shared experience and develop a common understanding among the stakeholders. Once a consensus is reached, change can proceed without significant emotional or logical resistance from the participants.

Many change management reports focus on the intervention process; however, very few reports exist regarding the identification and sharing of pluralist views, or different world views, which result in passive or outright resistance to change. Soft systems methodology can be used to provide insights into identifying these differences, generating learning experiences that become change levers.

Checkland's Soft Systems Methodology (Checkland 2000) presents as being a powerful holistic approach that is highly developed. It delivers effective levers of organisational change as it enables participants to engage in a continuous learning

process that enhances the willingness to collaborate in achieving the desired outcome and is inclusive of the cultures of both the participants and the end users.

The application of Soft Systems Methodologies (SSM) in practice has been examined by Mingers and Taylor ((1992). They found that soft systems methodology is often used to develop understanding, but had limited application in identifying the context in which change could be optimised. Soft systems methodologies have been applied to modelling organisational change programs and have been successful in enabling conceptualisation, understanding, planning and implementation of change (Checkland 2004). SSM was further used to develop information systems and management strategies for hospitals in the English NHS (Checkland and Scholes 1998). Houghton and Ledington (2002) reviewed SSM and its application in improving unstructured problem situations. They concluded it was useful in generating purposeful action but did not identify any tools for change. Foster-Fishman and Behrens (2007) discussed insights into methods for systems change. They concluded that SSM gave voice to diversity by enabling stakeholders to create worldviews that accommodate different perspectives without forced consensus. They make reference to the idea of seeking change levers but do not identify them.

Thus, there is an opportunity to develop new knowledge in optimising or leveraging change using a soft systems approach. This research will focus on the application of the methodology to five case studies, where the outcomes are evaluated to identify the characteristics with the greatest yield. These outcomes are characterised as change levers for these particular cases.

This research is aimed at extending the application and effectiveness of soft systems methodology when applied to managing and progressing change in organisations. In particular it is directed at predicting the most appropriate interventionist actions for managing and accelerating change. It is considered a more appropriate approach than a means-ends approach, as it accommodates divergent views within a common framework and allows for experiential learning to be integrated into the system.

The research will focus on providing new knowledge in the application of soft systems methodology to identifying change levers that can enhance the rate of change in organizations.

1.3 Appropriateness of Research Design

This thesis will consider the difficulties and questions facing change managers and will present a case for the application of Soft Systems Thinking and Soft Systems Methodology in identifying change levers, which may be applied in optimising both the effectiveness and timeliness of change in organisations. The thesis presents a review of the background and literature supporting the field of systems science, and a review of the current techniques of change management. It will also present a discussion of the theory underpinning the research. Data used will be collected and analysed using a qualitative approach. The prime source of data will be from interviews with managers and workers involved in using soft systems methodology for organisational change. The research seeks to demonstrate the validity of soft systems methodology in identifying change levers that can optimise or accelerate the process of change.

Soft Systems Methodology (SSM) emerged in the 1970s and was developed in the 1980s as a new branch of systems thinking. Based on the precise methodology of systems science, Checkland began to explore the application of systems engineering methodology to messy managerial situations where there is no clear view on 'what constitutes the problem', or what action should be taken to overcome the difficulties being experienced. The models developed for change in social systems were described as 'soft' systems situations (Checkland 1983).

In Soft Systems thinking, people play a central role, and they can change things just by thinking differently (Cavaleri and Obloj 1993). SSM is best suited to situations where there is a coalition of organisational stakeholders, and the need is to create a shared appreciation among those stakeholders of what is the best way forward from a given problem situation. It is extremely adept at providing creative solutions that enable organisational actors to escape the traps of conventional thinking. Through

multiple perspectives, SSM promotes a truly thorough examination of why a business exists and hence helps to more fully identify pathways to logical conclusions.

Perrow (1970) assessed the systemic structure of organisations as influencing the behaviour of its participants and of being the dominant factor in their behaviour. The systemic structural elements identified as having the most influence over behaviour were the network of feedback loops. Consequently efforts to optimise change, or the rate of change, in organisations can be directed at the most influential feedback loops. Senge labelled these important areas as leverage points (Senge 2006).

Although the current body of knowledge discusses a range of applications of SSM in which change may proceed, it is not extended to applications for optimising change where SSM is applied to raising objections to change, or to finding points of high yield of learning and understanding that act as change levers.

Soft Systems Methodology is an iterative process of inquiry into complex, messy problems, using systems thinking and systems modelling followed by systems intervention. It is particularly useful in analysing human activity systems and is best employed in pluralist contexts, where there is a basic compatibility of interests, where values and beliefs of participants diverge and yet where genuine accommodation and compromise is possible. Furthermore, since systems models are always used in the methodological scheme, SSM clearly assumes that pluralist issues are tied in with complex issues of organisational structure and process. (Checkland 2000)

SSM believes that problem situations arise when people have contrasting views on the same situation. The notion of a plurality of possible viewpoints, and consequently the acceptance of many relevant problems, emerges. SSM therefore rejects the means-ends approach and introduces two paradigms of systems thinking: the hard (or ideal) systems where the application of scientific methodologies will produce predictable results, and soft (or real world) systems where people are components of the system and where knowledge based on experience leads to purposeful action. The yield from this action is related to the level of learning of the participants.

The research will therefore seek to establish if the yield of this action can be leveraged when using SSM. Case studies will be conducted to identify the outcomes of the

research questions. These case studies will be conducted across a range of very different industries and organizations to generate a broad picture of complexity in its different forms.

1.4 Research Objective and Questions

The objective of the research is to discover whether organisational change can be optimised in both efficacy and timeliness by identifying levers for change that will enable the participants to adopt a new concept of their environment, both emotionally and logically. This is to be achieved by applying soft systems methodology (SSM) as a means of identifying the experiential learning and subsequent consensual accommodation characterised as change levers.

The following research questions shown in Table 1.1 form the hypothesis of the research and will be answered by the research:

Table 1.1 Questions to be Answered by the Research

Questions to be Answered by the Research
1. Can the means of optimising change in organisations be identified and modelled consistently, using a soft systems approach?
2. Will the models developed be applicable across a range of real world organisations and cultures with a diversity of thinking?
3. Can the rate of change in an organisation be leveraged by intervention, when applying leverage points identified in a soft systems approach?
4. What will be the level of influence of existing systems' climate and boundaries on the effectiveness of the models in leveraging change?

1.5 Scope of the Research

The research addresses unstructured real world problems and uses soft systems methodology to generate ideal conceptual models of systems required to achieve the transformation needed by the organization. The transformation process is analysed using an interpretive approach to identify experiential learning, where pluralist views are expressed and a consensus is reached. When consensus is achieved in the emotional and logical mindsets, it is characterised as a potential change lever. When applied to enhancing the passage of change, it is a new application of the soft systems methodology.

The implementation stage of the transformation is noted in places; however, it is not part of the scope of the study. The research focuses on the identification of change levers. It will be evaluated in the education, local government, construction and manufacturing industry sectors, using case studies conducted with input from corporate professionals and participants.

1.6 Implications for Organizations

Organizations faced with pressing or mandated change in order to remain viable and competitive can be frustrated by ingrained mindsets, fear of the unknown and widespread resistance to their plans. This can quickly lead to inappropriate adversarial attitudes that will delay the process further. Many organisations have become frustrated with change efforts and have reverted to lay-offs and rehiring in an effort to rebuild culture to affect change (Glass 2009). Prudent management suggests building capacity for change among employees by moving to team based and experiential learning.

Ford (2007) describes high-level transformations as system changes which involve consideration of the interdependencies and interrelatedness of organisational components in a holistic way. He argues that it is important to understand how individuals feel about their workplace. Tapping employee and stakeholder insights by discussion and involvement with processes such as soft systems methodology can lead

to changes in the way people behave. Alignment of mindsets of beliefs and values can form a powerful lever for change.

The benefits of this knowledge and technique to Australian industry may be widespread. Organisations that can develop a learning culture leading to congruent beliefs and values among their employees can be quick to respond to change and can remain competitive in today's dynamic world.

1.7 Structure of the Thesis

This thesis is structured in two parts. **Part one** consists of chapters two to five. These chapters contain a detailed discussion of the background and principles of the soft systems approach to management science and its application to the social sciences. They also include the methodology adopted. **Part two** consists of chapters six to eight detailing the case studies undertaken, a discussion and summary of the findings and their contribution to the body of knowledge in the application of systems science. Greater detail of each chapter is given below.

Chapter two traces the history of the systems thinking concepts from the pioneers of the general systems theory through to its application to social systems. It considers the development and application of systems models in dealing with complex messy situations. It introduces soft systems methodology as a means of addressing these types of problems.

Chapter three provides a detailed explanation of soft systems methodology and the seven step process of its application. It also provides a critique of the methodology with emphasis on the iterative nature of the technique and its limitations.

Chapter four addresses the topic of organisational change and introduces the concept of change levers. It describes the use of soft systems methodology in identifying points of leverage in the dynamics of change. The chapter concludes with soft systems management being presented as an approach to closing the gap in current knowledge of the dynamics of change at managerial level.

Chapter five describes the ontological and epistemological position adopted for the research. It discusses the research design and qualifies the case studies selected for study. It also provides a discussion and justification of the case study methodology of data collection along with comments on the ethics, quality of data and data verification.

Chapter six provides details of the five case studies considered. The data provided through the interviews with up to fifty individuals in the respective companies is discussed. Individual scenarios are considered, which use soft systems methodology modelling of the change situation, to identify points of high yield of learning. This level of understanding can enhance change by leveraging the rate of the change process.

Chapter seven is an analysis of the results drawn from the data and models and a summary of the findings. It provides an evaluation of the models used and a critique of their effectiveness.

Chapter eight discusses the conclusions drawn from the study. It places them in the context of their contribution to learning, identifies the limitations and constraints of the study and identifies opportunities for further study.

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Part I: Literature Review and Methodology

The literature on systems thinking is reviewed in chapter two along with its application to socio-technical systems. Soft systems methodology is then introduced as an approach to dealing with complex messy problems where pluralist views exist on the way to proceed. Chapter three provides an overview of the process of applying soft systems methodology. Organisational change theories are then discussed in chapter four. The research methodology is discussed in chapter 6.

Chapter 2: Literature Review

2.1 Introduction

The literature review discusses the concept of systems thinking and provides a theoretical background for the problem context. It illustrates the researcher's depth of comprehension of systems thinking drawn from secondary sources. The review covers the background of systems thinking and its application in dealing with complex problems. It further relates systems thinking to human activity systems in an organisational setting. It concludes with the introduction of Checkland's soft systems methodology as a means of dealing with complex problems where pluralist issues are part of the organisational structure and process.

2.2 System Complexity

The number of system elements governs the level of complexity of the system. Each of the elements may have a number of differing states, giving a number of different possible connections between elements. This gives rise to dynamic complexity of a system. Increases in complexity can result in time delays, as feedback is fed from one element to another.

Senge (2006) identified that businesses and human endeavours are also systems where actions and interactions occur, bound by interdependent fabric and affecting the

system as a whole. To address issues in the system, he states the need for a conceptual framework, looking at the entire system to help us see complex situations more clearly.

According to Senge (2006), systems dynamics is the study of complex systems, including such human systems as families, organisations, cities and nations. If you consider any system and analyse the relationships between elements, an infinite amount of complexity can be found. Senge maintains that to deal with complex systems we need to start with low levels of complexity and build up the degrees of complexity until we are handling complexity in the intuitive domain. At this stage there is an integration of the intuitive domain with the normal rational awareness domain that transcends modelling of the problem. He uses as an example a concert pianist's growth from student to an accomplished performer. The individual's awareness is freed from concentrating on the fingers to focus on the aesthetic. Similar analogies could be applied to learning to drive or learning to fly. Senge describes this as a rapport that has developed within the person's own consciousness between the self-conscious awareness and a more automatic level of consciousness capable of dealing with much greater complexity.

In attempting to address change in organisations where this level of complexity exists, a structured methodology based on a theoretical framework, using questions and reflections leading to increased understanding about the unstructured problem, can be productive. Soft systems methodology can fulfil these needs and can make sense of the complexities presented in messy unstructured problems (Sankaran, Tay et al. 2009).

2.3 Organisations as Systems

Organisations display the characteristics of systems in terms of having inputs, transformation and outputs in a particular environment. They have subsystems that consist of multidisciplinary activities that may cross traditional functional department boundaries. The activities of the subsystems may be optimised by strategic alignment of sub-units and by matching activities and outputs to environmental needs. Activities

and outputs can be analysed and modelled based on the quantifiable dynamics of the system. However, the human-to-human interaction in the organisation introduces a much higher level of complexity and a significant rise in the level of uncertainty. An organisation that is being managed as a system, addresses its business issues through systemic analysis, systemic solutions and systemic execution of those solutions. The emphasis being on integration of all its activities, including the human activities of perception, feeling and response, the interdependence of the elements or components and the interaction with the environment.

One of the first organisational theorists to use the systems approach to organisations was Barnard who believed that organisations existed by means of an established equilibrium between the contributions and the satisfaction of the participants. Barnard also recognised that knowledge and human interaction were elements of organisational systems (Landsbury 1983).

Amagoh (2008) explains that a view of organisations, which suggests an approach that can eventually lead to a better understanding of the impact of change and a more accurate estimate of outcomes, is the systems view. Used in concert with any of the existing planning methods, the systems approach presents a model for considering the impact that change will have throughout the entire organisation and therefore assist in planning and implementation. The systems view is a way of thinking about the job of management by considering the organisation as an *integrated whole* made up of *interacting parts*.

Attempts to consider the impact of change often fall short when the organisation is considered in terms of its structural parts such as marketing, production, research and development, etc. This myopic look at the organisation does not allow for the anticipation of results in other areas, or subsystems, within the organisation. The systems view of organisations provides a framework for looking at the organisation as a whole in terms of process-related subsystems as shown in Figure 2.1. Each subsystem in the organisation is separate and definable, but it is also interrelated and interdependent. These sub-systems are common to all organisations, from small to large multinational corporations (Amagoh 2008).

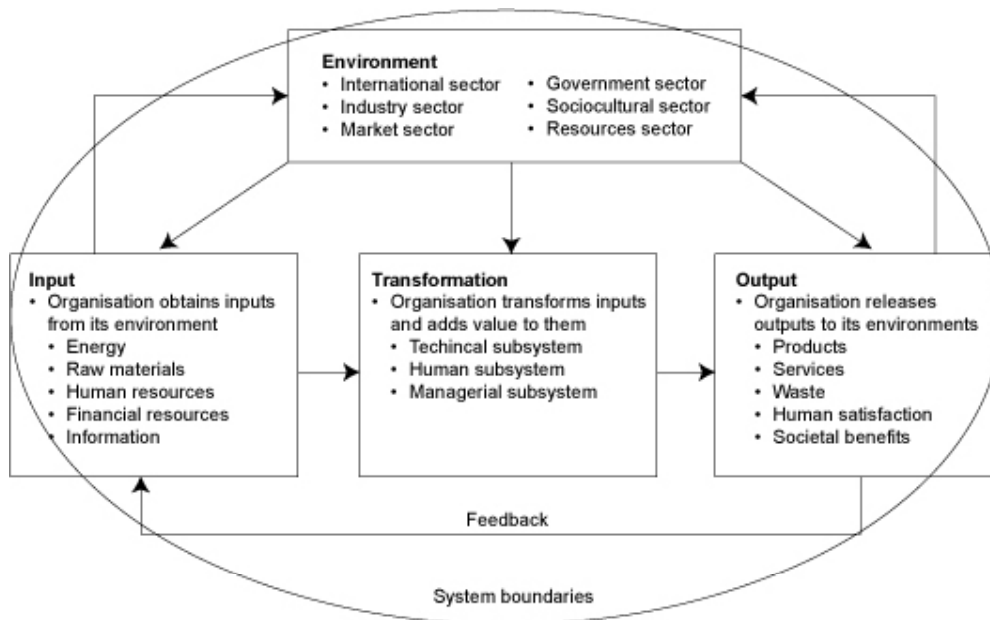


Figure 2.1 A System Based Framework of Organisations

Source: (Amagoh 2008)

Kast and Rosenzweig (1985) also point out that the systems approach has become the operating framework for both the physical and social sciences. When looking at organisations, the systems approach provides us with a way of viewing the total organisation and its interaction with its environments and its subsystems. This then enables us to consider contingency approaches to organisational structure or change.

2. 4 Socio-technical Systems Theory

By considering organisations firstly as open systems, then as socio-technical systems, we can apply the concepts of socio-technical systems theory to their behaviour.

Socio-technical systems theory is arguably the most extensive body of conceptual and empirical work relating to the relationship between the involvement of employees and the design of their work to be found today. Originally developed at the Tavistock Institute of Human Relations in London, this approach has spread to most of the industrialised nations in a relatively short period of time.

Cherns (1976) early work defines all organisations as socio-technical organisations. He points out that for any social system to survive, it must comply with the functions of Parson's four sub-systems. These are defined as: (a) the attainment of the goals of the organisation; (b) adaptation to the environment; (c) integration of the activities of people in the organisation, including the resolution of both organisational and interpersonal conflict and (d) providing for the continuance of essential roles through recruitment and socialisation. He explains that the goals of an organisation cannot best be met solely by optimising the technical system and then adapting a social system to it, but by joint optimisation of both systems. This then infers that the adaptability and innovation of people is sought and applied to the holistic optimisation of the organisation's goals. Cherns (1987) argues that it also requires a constructively participative organisation to be successful.

As the organisation could be perceived to be a combination of technical sub-systems and social sub-systems, an approach to integrating the two was required. Initially a process of iteration was adopted that both satisfied and stimulated the societal needs. Emery, who pioneered the socio-technical systems approach, identified six psychological requirements for satisfactory integration. They were: responsibility, learning, social support, meaningful work and personal growth. Of these, the personal growth factor was considered to be an outcome of the satisfactory attainment of the other factors (Emery and Trist 1981; Emery 1993). Shani also argues that addressing the socio-technical system of an organisation is a complex process and that any changes proposed for one of an organisation's subsystems need to meet the needs of the other subsystems. Of the subsystems, the social subsystem is the key to

conceiving and implementing change in an organisation (Shani, Grant et al. 1992). Appelbaum (1997) also supports the view that the various subsystems are interdependent and to achieve organisational change, the needs of each subsystem must be considered .

In order for the application of systems science to address the realities of current world situations and problems in the areas of humanities, there is a need to address the human, environmental and cultural norms of the individual and their perceptions of these characteristics. Some social organisations may have limited technical activity and could be described as human activity systems. Patching (1990) points out that human activity systems comprise a system of activities, where relationships have logical dependencies, plus a social system, where relationships are interpersonal.

2.5 Organisations as Socio-technical Systems

Emery and Trist (1981) argued that for an organisation to be considered as a system, it needed to be considered as an open dynamic system. They also argued that when considering the boundaries of an open dynamic system, neither the social system or the technical system of the enterprise should be considered as background material, as they are both active in the dynamic process of the organisation but rely on each other to achieve and maintain dynamic equilibrium. The open dynamic system must consequently be referred to as the socio-technical system (Emery and Trist 1981; Emery 1993). Considering organisations as open socio-technical systems helps to provide a more realistic picture of how an enterprise is able to be influenced by and respond to its available environment (Emery and Trist 1981).

Further studies by researchers from the Tavistock Institute developed the concept of a socio-technical system where they identified that every organisation consists of both social and technical sub-systems. The social sub-system is the relationship between the participants in the organisation and includes the work organisation, which relates those who carry out the task to each other. The technical sub-system consists of the tasks to be performed and includes the relevant equipment, facilities and techniques.

They saw organisations not simply as technical or social systems but as a structure of human activity around various technologies. They considered the social system as a key element, as it determined the efficiency and effectiveness of the utilisation of the technology (Landsbury 1991).

Socio-technical systems undergo change from the basic continuous improvement to the more complex system wide changes. All levels of change involve the social sub-system. Experience has shown that the change process will be optimised if the social and technological systems can meet the requirement of the social participants, the organisation with its technical requirements and the environment in which it operates (Van Eijnatten, Shani et al. 2008).

Socio-technical systems application was seen by Emery and Trist (1981) as working to correct or moderate the level of uncertainty in systems consideration. They point out that organisations that are not socially and technically aligned, have difficulty in adapting successfully to change. The socio-technical system, however, has not been known for its practical application, as the practitioner must have the skills of a sociologist and an engineer to be able to effectively use the systems for socio-technical change (Cherns 1987; Jones 2006).

2.6 Systems Science as a Field of Enquiry into the Social Sciences.

The study of organisations and the dynamic relationships between and among people within them and the social, cultural and natural environment, can be facilitated by the application of systems science. One of the earliest thinkers on the application of systems science was Geoffrey Vickers. He found that systems thinking provided a very useful framework when considering human behaviour. The title of his book *Human Systems are Different* emphasises his view that human systems consist primarily of relationships. He considered them as open systems and described the key elements of open systems as regulation, stability, growth, organisation, limitation and interdependence (Vickers 1983). Organisations present complex relationships between these elements and the systems approach provides a holistic means of enquiry. In fact, von Bertalanffy has described the systems approach as ‘the general

science of organised complexity'. Also, Ilya Prigogin noted that 'the basis for any natural law describing the evolution of social systems must be the physical laws governing open systems, ie, systems embedded in their environment with which they exchange matter and energy'. When applied to the humanities, systems science can model complex interpersonal, intergroup, individual and natural interactions without reducing the subject matter to the level of the individual. So the systems sciences offer a powerful conceptual approach to comprehending the interrelation of humans, society and their environment, whether it is the natural environment or their work environment. Boulding (1956) points out that a systems model, either mathematical or physical, does not necessarily have any connections with the real world around us. It may, however, consider all thinkable relationships of the empirical world. The value here is that a system, or a range of systems generally referred to as a system of systems, can identify gaps in the theoretical models and subsequently direct research towards resolving them.

The predominance of man-made or artificial systems in our environment, which follow the second law of thermodynamics, ie, they suffer an increase in entropy until reaching equilibrium and require constant energy input to remain dynamic, tend to distract from natural systems which remain stable by interaction with the environment or by self transformation, to cope with a changing environment. Systems ranging from the global eco-system down to atoms and molecules can be considered as natural systems. Complex socio-cultural or human systems can also be included as natural systems as they do not require energy input to remain stable and dynamic.

To better understand natural systems, a study of the system dynamics can be used to assess system behaviour, rather than the traditional linear analytical approach of studying the system elements, sometimes in isolation. In real world situations, human systems are exposed to a large number of external forces and events that make the dynamics of their existence extremely complex. Consequently, there is a potential problem in attempting to model complex human systems using classical analytical methods (Laszlo and Laszlo 1997).

Systems can be observed to have characteristics not apparent in their elements. These characteristics can be quite significant and can only be found in the system as a

whole. If the systems is analysed as a series of elements, the system characteristics are not present in the elements. Nor can the individual elements deliver the output of the system. By focusing on the whole integrated system, rather than the more tradition analysis of component parts, we are in a better position to firstly observe the complex dynamic relationships and interactions which occur in complex systems such as socio-systems; and secondly to understand how to influence them.

Laszlo explains that the systems sciences do much to render the complex dynamics of human socio-cultural and socio-political change comprehensible. The advantage of the systems sciences is their potential to provide a cross disciplinary framework for the exploration of the complex and many faceted relationships between people and their social, cultural and work environments. These explorations can be both critical and normative and the systems framework can provide a holistic approach to resolving issues of potential change and potential opportunity (Laszlo and Laszlo 1997).

The following diagram shown in Figure 2.2 illustrates the progressive development of systems science into various theoretical branches.

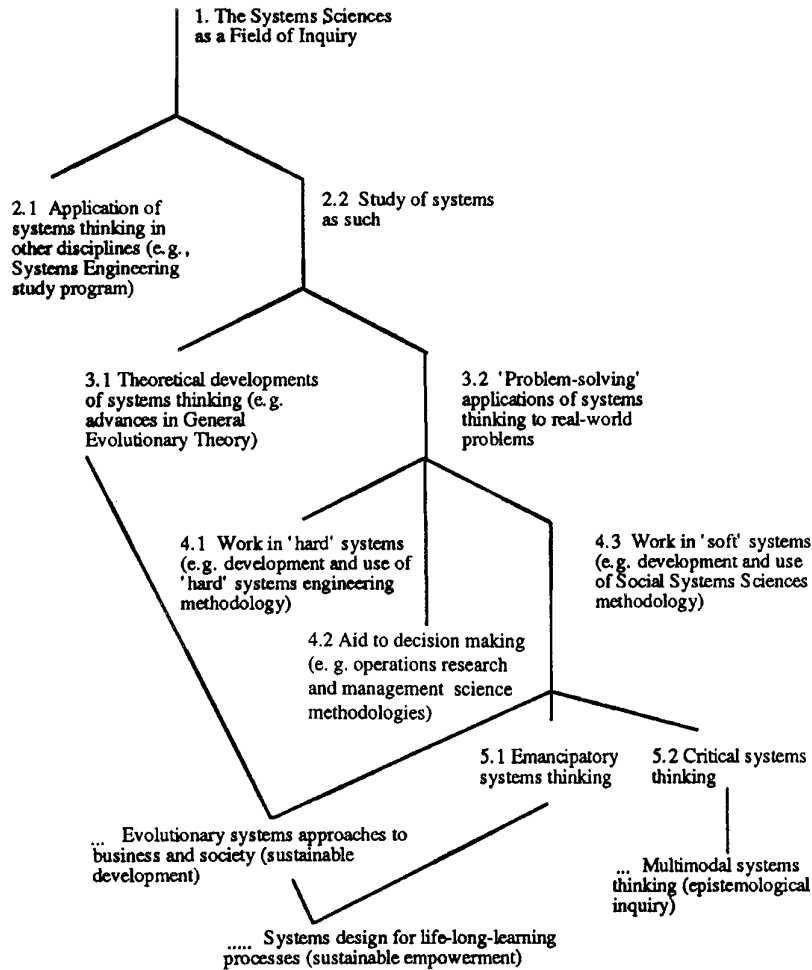


Figure 2.2 The Shape of the Systems Movement, Indicating the Progressive Development of Particular Theoretical Branches. Source: (Laszlo and Laszlo 1997)

These ideas were further developed in the field of action research, which seeks to improve the organisation's ability to improve itself and develop competencies by experiential learning and design (Alder, Shani et al. 2004; Coghlan and Brannick 2005).

2.7 The Identification of Social Capital

Optimum use of systems methodology and application requires the researcher to address the concept of social capital. Smyre (1998) identifies social capital as the relations, trust, norms and sanction among members of an interactive team and is measured by the level of cohesion that exists between members. As a team can be perceived as a system within a boundary, it forms a sub-system of an organisation.

2.8 Modelling of Systems Transformation

The foregoing discussion has shown that the systems approach has become the operating framework for considering organisations as social entities that can be modelled using systems thinking. Soft systems methodology employs modelling at three levels. The unstructured problem is modelled in a rich picture. This is done in cartoon-like diagrams showing boundaries, structures, communications, constraints, conflicts and emotions. The richness of the diagram comes from the inclusion of both formal and informal elements. The root definitions, which are the key to defining the purposeful activity to be modelled, are tabled as linguistic models and the ideal concept of the outcome of the transformation is modelled in the conceptual model. The strength of the models is that they can address any complex situation. The root definitions and conceptual models are built by the stakeholders in an iterative process which means that the outcomes are owned by the participants and not an imposed solution (Gregory and Lau 1999).

Checkland (2000) also presented the concept of SSM in model format with the seven-stage process shown as a diagram, as illustrated later in Figure 3.1.

The benefit of these models, in considering a transformation, is that they include the human dimension. Wilson (2001) emphasises the appropriateness of the SSM models in dealing with complexity and coping with real life problems. The application of the CATWOE mnemonic in building the conceptual transformation brings out various perspectives on problem situations as well as questioning assumptions. Bergvall-

Kareborn et al. (2004) discuss the CATWOE application of SSM models and suggest that the technique is strong and captures important issues useful for consideration in modelling.

2.9 Experiential Learning as a Systems Change Tool

Senge (2006) relates systems thinking to organisational change in terms of the importance of shared vision and team learning. He explains that organisational change also requires emotional change that can be obtained through experiential learning. He also posits that collective aspirations or a shared vision of the future, encourages people to find leverage points to help them close the gap between their present world and the conceptual world. Very little was found relating to specific system change levers other than brief general references in case studies. Senge points to intimacy and authority as elements of change levers.

Senge's ideas popularised the concept of the learning organization. The learning organization is described as an organization that purposefully designs and constructs its structure, culture and strategies with the capacity to learn so that it can continually adapt and change as needed (Pierce, Gardiner et al. 2002).

2.10 SSM Applied to Complex Human Interaction

In addressing a problem from a systems perspective, the practitioner first characterises the problem in terms of its dynamics, then looks inwardly to the associated subsystems and outwardly to the environment and the supra-system. Here we can draw a distinction between hard systems and soft systems. Hard systems can be described as a system with identifiable links between elements and quantifiable outcomes. They may be highly complex but have definable boundaries. Soft systems, on the other hand, involve people among their principal components. This introduces a very high degree of complexity, as each individual may have varying degrees of agreement on goals, their goal may change over time and there is likely to be conflicting goals operating simultaneously. Consequently, it was recognised that

the application of hard systems methodologies to problems involving social, cultural and political elements were not appropriate tools for dealing with these type of complexities and ambiguities (Jackson 1982).

The soft system approach can be used to see the world through the eyes of another and so reveal different points of view about the goals or how they may be attained. Hence we can say that soft systems thinking probes the worldview or ‘Weltanshauungen’ of individuals. It can be a window into their appreciation of their environment. These views are expressed in the ‘root definition’ stage of the soft systems process and lead to the levels of complexity experienced when dealing with social systems. A group may have quite diverging interests that may be contradictory. There may be different levels of power and authority among the members; however, as members of the same group, they are likely to form a loose coalition of supporters for a common outcome. Flood and Jackson (1991) describe this as a pluralist characteristic in terms of the issues of group interest, conflict and power.

Flood and Jackson developed a system of systems methodologies where they put forward an informed approach to solving problems using systems approaches. They have developed the following matrix, shown in Figure 2.3, based on assumptions made about problem context.

	UNITARY	PLURALIST	COERCIVE
SIMPLE	<u>S-U</u> <ul style="list-style-type: none"> • OR • SA • SE • SD 	<u>S-P</u> <ul style="list-style-type: none"> • SSD • SAST 	<u>S-C</u> <ul style="list-style-type: none"> • Critical systems heuristics
COMPLEX	<u>C-U</u> <ul style="list-style-type: none"> • VSD • GST • Socio-tech. • Contingency theory 	<u>C-P</u> <ul style="list-style-type: none"> • Interactive planning • SSM 	<u>C-C</u> <p style="text-align: center;">?</p>

Figure 2.3 System of Systems Methodology Matrix

Source:(Flood and Jackson 1991)

From the matrix, it can be seen that for a problem that is both complex and pluralist, soft systems methodology (SSM) is an applicable problem-solving approach. It is also evident that no particular methodology is assigned to the ‘complex-coercive’ situation. As one of the case studies in this research involves elements of coercive behaviour, it provides an opportunity to model the use of soft systems methodology in this application.

As soft system thinking is based on the belief that as people have differing views of the problem situation due to their mental modes, there may be no one single correct answer that satisfies all participants. Cavaleri and Obloj (1993) suggest that the most appropriate solution to complex messy problems can best be achieved by the application of soft systems thinking. They further outline six principles that underlie the soft systems approach and distinguish it from other approaches as shown in Table 2.1.

Table 2.1 Principles Underlying the Soft Systems Approach

Principles Underlying the Soft Systems Approach
Perceptions and experiences are subjective and are subject to various interpretations.
Problems become enacted through people’s conditioning and perceptions.
In complex messy situations, it is more important to identify general issues.
There are no permanent solutions, only improvements.
Systems are projections of the mind, not real objects.
System improvement rely on learning and accommodation, rather than optimised outcomes.

2.11 Current Research on Extending SSM Applications

Organisational change processes that take six to twelve months to enact in today’s world of increased global competition are problematic. Some approaches to optimising or accelerating change have been to optimise the fit between the business environment and the organisation’s capability (Beer 2001; Beer and Einsenstat 2004). Organisational learning is also an element of the optimal change process. It can be seen as a continuous process that can facilitate the redesign of an organization (Senge

2006). Shani and Docherty describe the stages of learning relating to change as learning dimensions. These learning dimensions form a set of alternative solutions from which participants can choose to meet the change requirements (Shani and Docherty 2003). However, the process has not been taken to the discussion and debate stage, as proposed by SSM, where an accommodation of views is sought as a means of abating resistance and moving forward.

Winter (2006) discusses the extension of SSM to project management and its use in structuring problems. It is also extended for use in determining simulation study objectives where it was adapted for this purpose. Kotiadis (2007) found that it could be successfully used to build conceptual models of the complex process, that it made the process more transparent and comprehensive, it surfaced assumptions and identified constraints and also that it engendered creativity.

Blixt and James (2004) emphasise the need for speed in affecting organisational change. They identify the drivers of change as increasing global competition, complex markets and the need for performance excellence in competing markets. They discuss shared strategy, leadership, critical mass and supporting systems as elements of accelerating change; however, very little is presented on methods of implementation or overcoming resistance and no use of systems thinking or systems methodology is applied.

Molineaux and Haslett (2007) found that SSM was useful in diagnosing and addressing organisational problems and creating new systems in cultures that are characterised by pluralist views and values. Their experience demonstrated that a high level of creativity was generated by the application of SSM workshops in a large government agency. Although their research showed opportunities to enhance creativity, they did not address the issue of enhancing or accelerating change.

Consequently, a gap remains in the literature where the use of SSM is extended to accelerate change in organizations. This research will develop new knowledge, which will show the use of soft systems methodology as an interventionist action for optimising change. By engaging system stakeholders in a process of collaborative learning, where understanding can accommodate other's viewpoints, points of high

yield of learning can provide the levers necessary for the timely process of moving forward with change, unrestricted by overt or passive resistance.

2.12 Summary

This chapter reviewed the body of knowledge relating to systems thinking and its derivative of soft system thinking. It also included the application of soft systems thinking as a methodology applicable to the analysis of human activity systems. The following Table 2.2 illustrates the references used in the various parts of the chapter.

Table 2.2 Summary of Literature Review

No	Chapter	Authors
2.2	Background to the systems thinking paradigm	Katz & Rosenzweig (1985)
		Anderson & Johnson (1997)
		O'Connor & McDermot (1997)
		Paul (1997)
		Tyson (1998)
2.3	Pioneers of the general systems theory	Von Bertalanffy(1972)
		Weeks (1991)
2.4	Concept of system behaviour	Anderson & Johnson (1997)
		Finnie (1997)
2.5	Systems thinking	Ackoff (1981)
		Cavaleri & Obloj (1993)
		Ackoff (1993)
		Jambekar (1995)
		O'Connor & McDermot (1997)
		Checkland (2000)
2.6	Systems complexity	Senge (2006)
2.7	Organisations as systems	Landsbury (1983)
		Katz & Rosenweig (1985)
		Amagoh (2008)
2.8	Sociotechnical systems theory	Cherns (1976)
		Emery & Trist (1981)
		Cherns (1987)
		Patching (1990)
		Shani et al. (1992)
		Emery (1993)
		Applebaum (1997)
2.9	Organisations as sociotechnical systems	Emert & Trist (1981)
		Cherns (1987)
		Landsbury (1991)
		Emery (1993)
		Jones (2006)
		Van Eijnatten et al. (2008)

Table 2.2 Summary of Literature Review - Continued

2.10	Systems science as a field of enquiry into the social sciences	Boulding (1956) Vickers (1983)
		Laszlo & Laszlo (1997)
		Smyre & Dooley (1998)
		Alder et al. (2004)
		Coghlan & Brannick (2005)
2.11	Modelling of systems transformation	Gregory and Lau (1999) Checkland (2000)
		Wilson (2001)
		Bergvall- Kareborn et al. (2004)

Chapter 3: Soft Systems Methodology

3.1 Introduction

This chapter describes the principles of Soft Systems Methodology (SSM) and its application. The process methodology is discussed in detail up to the stage of intervention. A critique of the methodology is also given which highlights some of its known limitations.

3.2 The Principles of Soft Systems Methodology

Soft systems thinking was introduced in the 1980s by Checkland and colleagues as an interpretive approach to the application of holistic systems thinking, as distinct from the reductionist analytical approach to problem solving. This was particularly suited to cases of complex messy unstructured problems where solutions were not apparent and the participants had a range of diverse views as to the way to approach or proceed with the problem. We characterise these situations as both complex and pluralist, with many indeterminable variables.

Soft Systems Methodology is at its core, a cyclic iterative approach of enquiry for formulating and structuring thinking about problems in a situation where people have diverse views of the world. Its process is the construction of conceptual models of solutions based on root definitions of the ideal systems required and drawn from a rich picture of the expressed problem. The conceptual models are then compared with reality and debate is stimulated about the underlying assumptions and changes required to bring about a desirable solution. Soft Systems Methodology is not about analysing systems found in the real world, but rather about applying systems thinking to problems in complex situations to provide a series of intellectual constructs that generate learning and understanding of the often hidden variables in the complex situation.

Checkland and Scholes (1990) describe the methodology quite succinctly as follows:

In SSM, a number of notional systems of purposeful activity, which might be 'relevant' to the problem situation, are defined, modelled and compared with the perceived problem situation in order to articulate a debate.... The methodology is used to facilitate learning about an environment. SSM set a chain of enquiry into motion in order to better perceive clearly the nuances of a complex situation. As learning occurs over time, purposeful action may then be taken to improve the situation.

The process was initially presented as a seven stage methodology, however, more recent research has presented a less structured, more flexible approach which has broadened the potential of the application of the methodology (Tsouvalis and Checkland 1996).

3.3 Soft Systems Methodology as a Seven-stage Process

Figure 3.1 illustrates six of the seven stages discussed in the thesis. The seventh stage is the action stage where change is implemented. This stage is not part of the current research.

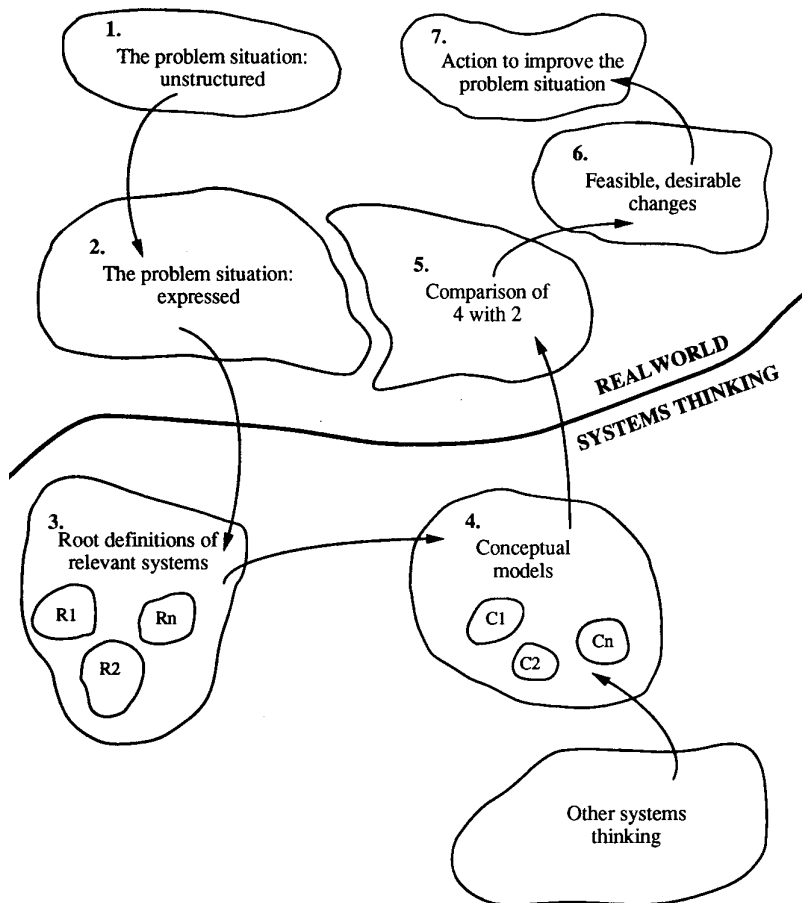


Figure 3.1 The Process of Soft Systems Methodology

Source: (Flood and Jackson 1991)

In order to emphasise the notion that the Soft Systems Methodology is not a linear process and that the learning comes from the iterative process of discussion, debate, consideration, appreciation and accommodation, Checkland and Scholes (1998) introduced a more contemporary form of diagram shown in Figure 3.2. This model illustrates the point that system models are used to initiate and manage the debate about purposeful change. For the purpose of this research, the seven-stage model is adopted to illustrate the full process and principles of the methodology.

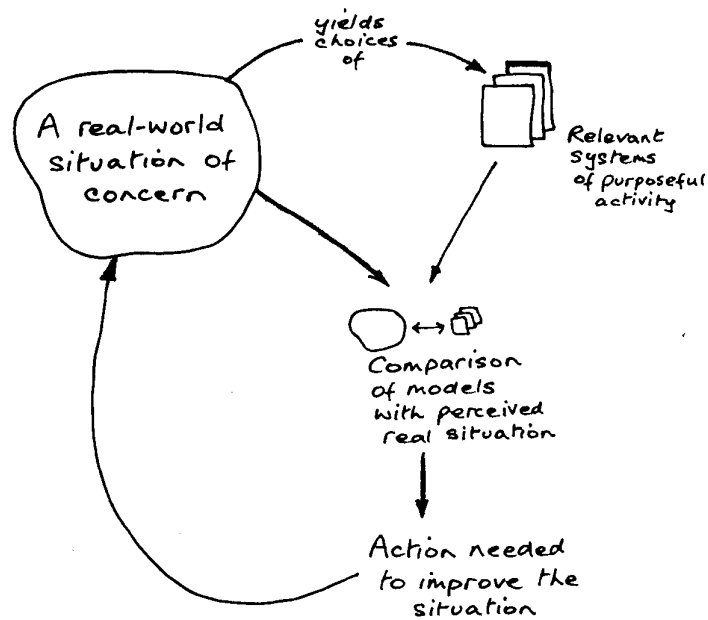


Figure 3.2 The Basic Iterative Shape of SSM

Source:(Checkland and Scholes 1998)

Stage 1: The Problem Situation Unstructured

This is sometimes described as the ‘finding out stage’. Here information is gathered about the problem from various sources. It may include written information, informal interviews, observations, formal samples or information from any available source comprising both primary and secondary data. Both formal and informal organisational structures are examined and any prevailing issues or assumptions are identified. Organisational politics and taboos can be identified and individual concerns or mistrusts can also be included.

The process of exploring the unstructured problem and expressing it in the form of a rich picture is illustrated diagrammatically in Figure 3.3.

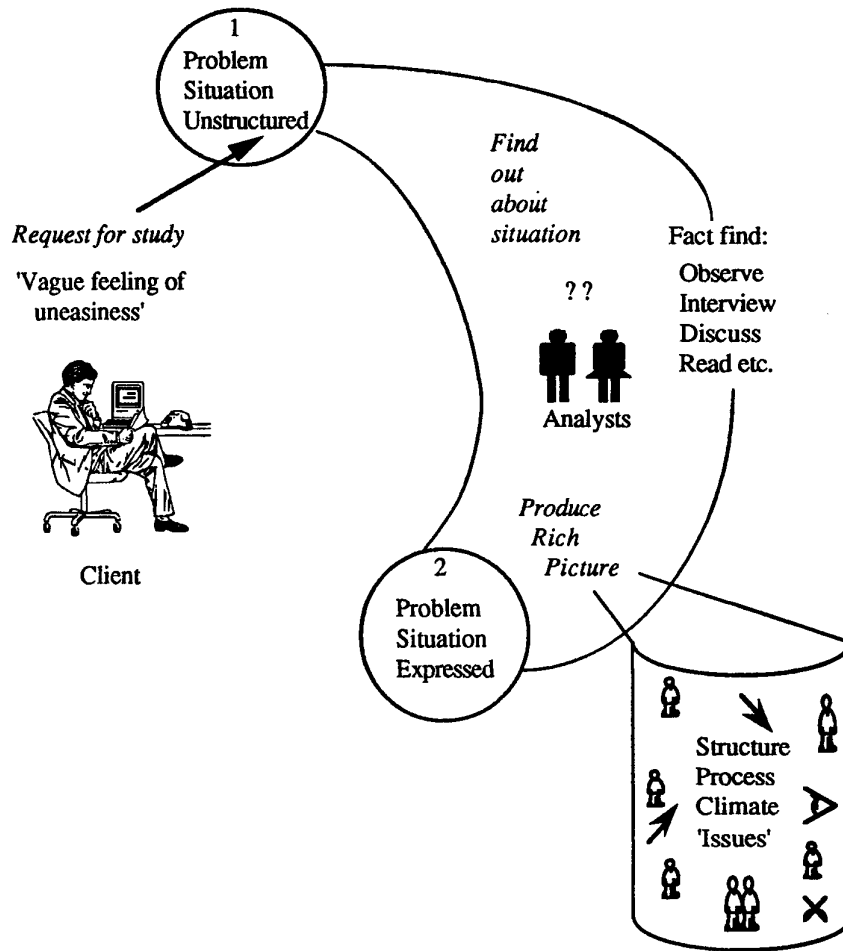


Figure 3.3 Exploring and Expressing the Situation

Source:(Patching 1990)

Stage 2: The Problem Situation Expressed

At this stage the situation is expressed pictorially as shown in Figure 3.4. This is known as a 'rich picture' and is a sketch, diagram or illustration, usually hand drawn, which depicts the elements and issues of the situation (Patching 1990). It is a collection of the perceptions or viewpoints of the participants. Its strength is that it also indicates relationships. The resulting illustration then enables the participants to address the problem from selected viewpoints and to be aware of the prevailing relationships. This is a way of consolidating the participant's understanding of the situation and reducing the possibility of an impasse which would stall the soft system process.

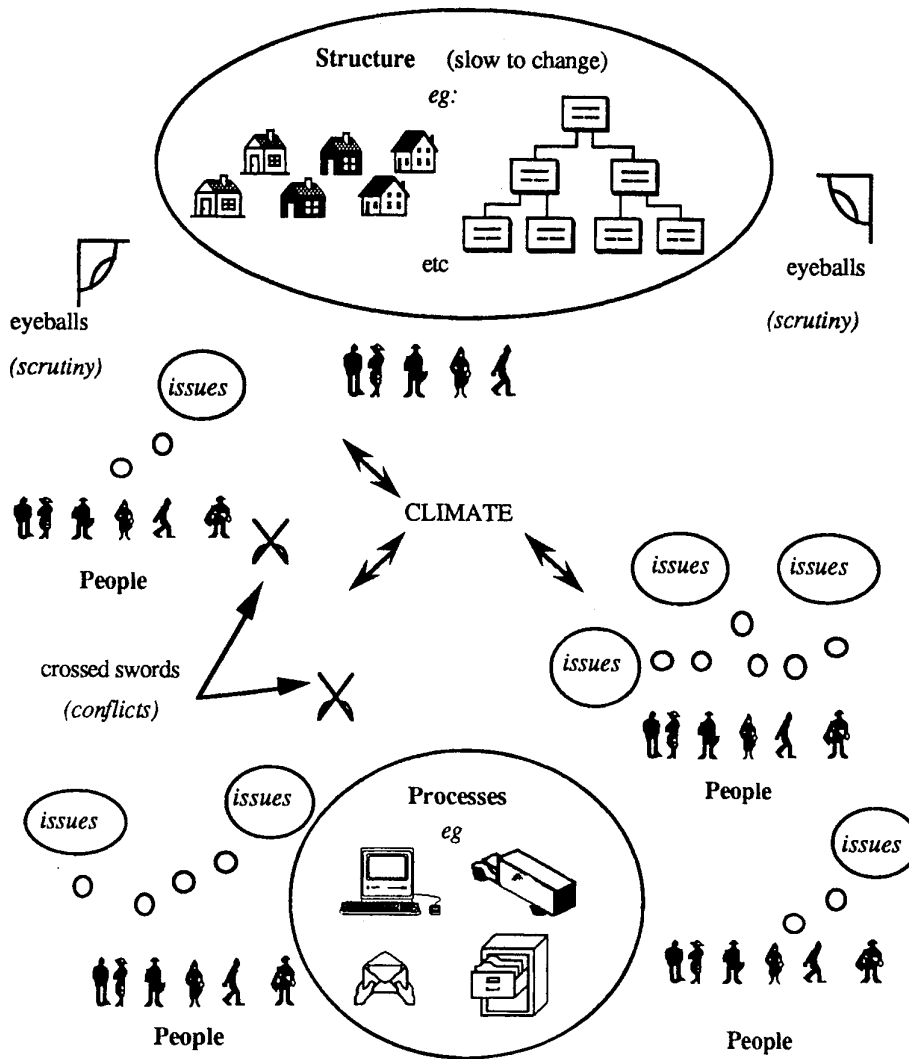


Figure 3.4 Characteristics of a Rich Picture.

Source:(Patching 1990)

Stage 3: Formulating Root Definitions of Relevant Systems

Here we move from real world considerations to modelling of virtual idealised systems that appear relevant to the problem. One or more root definitions are then developed which become the basis for subsequent models. Flood and Jackson (1991) explain that root definitions are idealised views of what the relevant systems should do. They explain that “the aim is to draw out the essence of what is to be done, why it is to be done, who is to do it, who is to benefit or suffer and what environmental

constraints limit the actions and activities” (Flood and Jackson 1991). A root definition should express the aims and means of the systems to be modelled in a short textual format.

Flood and Jackson (1991) explain that the mnemonic **CATWOE** is used to identify the following six elements that should encompass the emergent properties of the system under consideration:

- **C**ustomers: the victims or beneficiaries of the proposed activity or transformation.
- **A**ctors: those who do the activity.
- **T**ransformation Process: the conversion of an input process to an output
- **W**eltanschauung: the world view that make the transformation meaningful
- **O**wners: those who have the power to modify or stop the system
- **E**nvironmental Constraints: constraints within the environment of the system.

The above elements are used to develop the root definitions that describe the problem under consideration. Root definitions generally describe primary tasks but can also be used to describe issue-based systems that may reflect particular or general viewpoints. Checkland emphasises that for systems thinking to remain coherent, there needs to be a careful distinction between what is required and how it is to be achieved (Checkland 2004). When developed, the root definition will consist of a short paragraph containing all the information necessary to describe the system and is used to develop conceptual models.

Stage 4: Conceptual Models

Conceptual models are derived directly from the root definitions and will define the minimum activity for the human activity system under consideration. Checkland (2000) defines the building of conceptual models as: “A systemic account of a human activity system, built on the basis of the system’s root definition, usually in the form of a structured set of verbs in the imperative mood.....”. His emphasis is on the minimum number of verbs necessary to enact the tasks described by the root definition. All the elements identified in the CATWOE must be included for the

transformation to be complete. The models need to be kept relatively simple. Patching (1990) advises no more than ten activities, with considerable emphasis on the 'what' rather than the 'how'. This approach is similar to the verb-noun approach of value analysis to mechanistic problem solving and to the 'what' rather than 'how' approach to objective setting used in management by objectives.

Earlier approaches to soft systems methodology included a dividing line between the real world situation and the systems thinking and conceptual activities. However, more recently Tsouvalis and Checkland (1996) have argued that in practice the dividing line was not helpful as it introduced a false dualism and that a more contemporary approach is a more inclusive holistic concept without implicit divisions of knowledge.

In constructing a model, the essential characteristics to capture should include clarity, simplicity, fidelity, traceability and it must be able to be verified against reality (Stevens, Brook et al. 1998).

Application of Conceptual Models

The Soft Systems Methodology (SSM) developed by Checkland is one of the most influential methodologies used to accommodate human factors in organisational systems. SSM provides a means of capturing the meaning of relationships that are created through the discourse between participants or actors, stakeholders and the environment in which they operate. It also offers a means of understanding the messy relationships between the social and political aspects of their behaviour.

The initial step in the modelling technique is the drafting of a Rich Picture, which is a diagram representing the relationships between the Clients, Actors, Transformations, World-view, Owners and Environment (CATWOE), within the scope of the system of interest.

Figures 3.5 and 3.6 illustrate a basic root definition for fence painting and its related conceptual model as described by Checkland and Scholes(1998).

Root Definition:

A householder-owned and manned system to paint a garden fence, by conventional hand painting, in keeping with the overall decoration scheme of the property, in order to enhance the visual appearance of the property

- C - householder
- A - householder
- T - unpainted fence → painted fence meeting criterion in the definition
- W - amateur painting can enhance the appearance
- O - householder
- E - hand painting

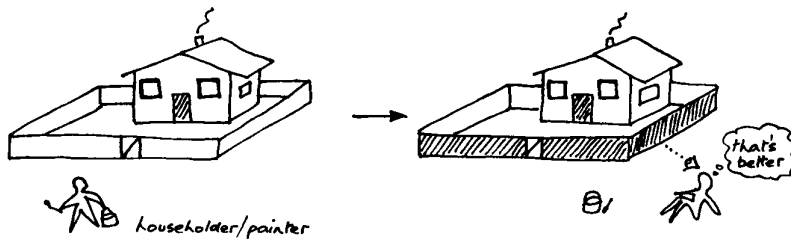


Figure 3.5 A Root Definition, CATWOE and Pictorial Representation of a Fence Painting System. Source:(Checkland and Scholes 1998)

The activities are placed in hand drawn bubbles and arrows indicate the dependencies.

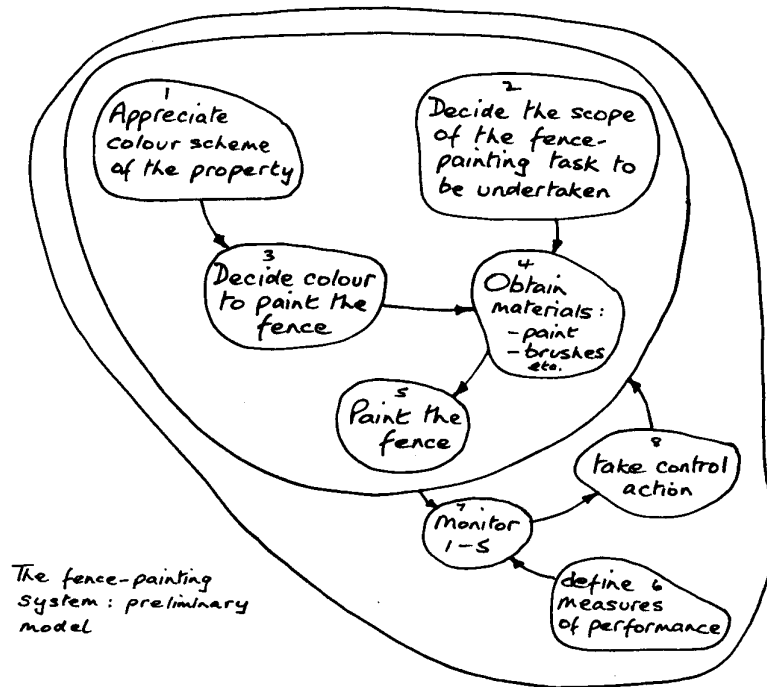


Figure 3.6 Dependency Diagram

Source:(Checkland and Scholes 1998)

Stage 5: Comparing Models with Reality

At this stage a level of debate is introduced to compare the model or models with the real world situation and to highlight possible changes. The discussion should focus on whether or not the various perceptions are being met and if there are any discrepancies. The comparison can be carried out in a number of ways such as by interviews or benchmarking or as Checkland suggests, by formal questions and the employment of a matrix for comparing conceptual models with real world situations (Checkland and Scholes 1998).

An example of Checkland's matrix is shown in the following Figure 3.7

<i>Activity</i>	<i>Exists or not in real situation</i>	<i>How is it done?</i>	<i>How is it judged?</i>	<i>Comments</i>
0				
1.....				
2.....			<i>criteria and current judgements</i>	<i>new 'whats' alternative 'hows' etc.</i>
3.....				
⋮				
⋮				
0 <i>Links</i>				
1 → 2				
2&3 → 4				
⋮				
⋮				
⋮				

activities and links from a model

Ideas about changes

Figure 3.7 The matrix as a Technique for Comparing a Conceptual Model with a Real-world Action. Source:(Checkland and Tsouvalis 1997)

He also added the further criteria by which a transformation would be judged, which he describes as the five E's. These are:

- Efficacy (will it work)
- Efficiency (will it work with minimum resources)
- Effectiveness (does it contribute to the goal of the organisation)
- Ethics (is it morally sound)
- Elegance (is it aesthetically pleasing)

Although the original approach developed by Checkland was fairly prescriptive, recent developments indicate that if root definitions and rich pictures contain sufficient detail to enable practicalities and implementation issues to be evaluated, the process is made easier. This is achieved mainly by ensuring that all the verbs used in the conceptual model stem directly from the root definition (Checkland and Tsouvalis 1997). This stage should then reveal areas where improvement may be possible.

Stage 6: Defining the Changes

At this stage the debate focuses on which changes are feasible, taking into consideration the cultural and political environment. The participants then need to come to an agreement or consensus as to which changes are systemically desirable. This may require some iteration of the process and revisiting earlier stages. Checkland suggests a return to the CATWOE elements to ensure there are no areas of contradiction or physical and financial constraints. A review of assumptions can also be revealing in creating a larger range of possibilities.

Checkland identifies three principal areas of change, namely: structural change, procedural change and attitudinal change. He asserts that the first two types of change are relatively straight forward and can be implemented by authority; however, the third type, relating to human activity, is far more difficult to implement and requires considerable monitoring to ensure it is being achieved. He describes attitudinal change as inclusive of influence, expectations, behaviour and some of the intangible characteristics of both individual and collective consciousness of people in groups (Checkland 2000). He further suggests that the changes considered should meet two

main criteria: they must be systemically or logically desirable and they must be culturally feasible.

It is the area of attitudinal change that will be the focus of the investigation of this thesis.

Stage 7: Taking Action

This is the stage where the accepted changes are put into action. The implementation may still require convincing senior levels of authority, however, the participants will have gained confidence from the continuous learning process of the methodology and from the reduced levels of uncertainty. They will have clarified and explored future options and will have gained a broader worldview of the organisation and its participants. As the changes are implemented, a new dynamic will result and the process of continuous refinement can continue.

3.4 Critique of Soft Systems Methodology

Soft Systems Methodology is in essence a dialectic process that leads to a consensus on the way forward in terms of change and improvement. It assumes a level of learning and insight among the participant that will enable consensus to be reached. As the group learn together, it becomes organisational learning. If this is not the case, the system falters, as an authoritarian or coercive approach is not an acceptable element of the process. It may rely heavily on the insights of the individual participants and may be limited by their exposure to experiences and to freedom of thinking patterns. It may also be hindered by the intellectual capacity of the participants or their deep convictions, prejudices and ideologies (Jackson 1982).

Checkland and Tsouvalis (1997) discuss the difficulty of developing conceptual models where the participants have had little organisational experience. This can be a real constraint on the capacity of the methodology to produce alternate systems. Mingers, cited in Checkland and Tsouvalis, also points out that although the

participants may agree on the characteristics of 'what' a conceptual model should do, there may be a variety of views on how it should be done, so involving a selection of valid alternatives. Mingers and Taylor (1992) suggest that Soft Systems Methodology has an inability to deal with situations of power and resistance to change and they point out that a majority of the respondents to their studies did not use the methodology to bring about change.

The methodology does not provide a solution to problems but rather a consensual pathway for action to move forward. It is an iterative process that may have to be revisited several times. As such it is somewhat open ended. It can be approached at any stage of the process and may be difficult to determine whether the level of success that has been achieved is sufficient to enable the participants to complete the journey of change.

3.5 Summary

Soft Systems Methodology developed by Checkland over 30 years ago has proved to be a much-tested process of social enquiry into complex problem situations involving human activity systems. It has been applied to a wide range of applications such as knowledge management, information systems, project management, risk management and information technology to name a few. It allows for key issues to be extracted from complex situations and from differing information sources. The problems and issues identified are defined in their immediate context. This provides a level of learning and understanding that inform subsequent action. Various feasibilities are raised and are checked by the iterative process, which also enhances its validity. Finally, the comparison of the conceptual models with the real world situation provides a call for action to resolve the problem.

Chapter 4: Organisational Change

4.1 Introduction

This chapter considers the theoretical framework for change followed by contemporary approaches. The concept of optimising change is discussed and change levers are defined. The chapter concludes with an argument for the adoption of soft systems methodology as a systems approach to change.

4.2 Traditional Change Theory

Almost every manager is faced with introducing a significant level of change to an organisation at some stage of his or her career. Change in government regulations, new products, new technology, increased competition and changes in personnel are just a few of the imposed changes that affect the business environment. Managers need skills in identifying the desired future and implementing change to achieve it. Managers' day-to-day experience will tell them that there will be significant resistance to change, which can range from complaints to deep-seated resistance. Regardless of how good the manager is at shaping and articulating the desired future, he still has to take the hearts and minds of his people with him. This emotional and logical shift must involve all stakeholders. Added to this difficulty is the pressure of time.

Seminal approaches to change theory, developed in the 1940s and 1950s by Kurt Lewin (1890-1947) and others, which introduced a staged approach to change, are still found in contemporary management texts. Although there is no one fundamental theory that addresses change management, Lewin's well-known change process is arguably the best recognised. It addresses the issue of organisation change in three stages, viz.:

- **Unfreezing:** Establish the need for change, identify problems and gather data to conduct initial diagnosis.
- **Movement:** Move to new behaviour through cognitive restructuring, with group problem solving, group feedback, joint planning and engagement in change actions, ie, group learning.

- Refreezing: Integration of new behaviours into social and organisational relationships (Lewin 1947).

-

Lewin's theory infers that the participants will cooperate with the change process and will not delay or inhibit it to satisfy personal agendas. This is in keeping with the cultural norms of the period where corporate requirements took precedence over personal needs.

Although Lewin's characterisation of the change process is somewhat dated, it is still used extensively in contemporary change philosophy as it provides a structure for thinking about change as a systemic staged process. A more contemporary view of Lewin's theory is expressed by Schein (1987). He sees the process of unfreezing as creating motivation and readiness for change. This can be accomplished in three ways, such as:

- Disconfirmation, participants recognise the need for change, are motivated to change and embrace change.
- An uncomfortable recognition of a gap between what is happening and what should be happening, and the desire to move to that preferred future.
- The development of an environment of psychological safety, providing a trusting situation where participants feel safe enough to venture into the unknown future.

Schein's second step could be described as cognitive reconstruction, or helping people to see a different worldview, so as to react differently. This can be accomplished by developing an understanding of other people's point of view or seeing new information or new pathways to achieving goals.

Schein's view of the third step of refreezing involves rationalising the change process in such a way that the person feels comfortable with it and can work with others in the new environment.

Lewin's process, however, assumes a certain level of dynamic stability in the organization, both before and after the change process. In the real world this is not always the case. Many organisations are thrown into turmoil by environmental

circumstances that change faster than the organisation can adapt. Alternatively, the organisation may have a radical change forced upon it, sometimes unexpectedly, by a change in ownership or a change in management. Radical change processes such as these are time critical as the imperative for change is beyond the control of the organisation's management. With planned change, managers can take time to motivate and persuade participants to adopt changes without coercion, however, contemporary businesses face change drivers with ever increasing frequency and pressure. Managers in these circumstances can readily conclude that coercive approaches to change as the only viable option.

This thesis argues that by identifying points of learning by participants, known as leverage points, a number of approaches to change can be optimised by reducing the time taken for participants to envisage, understand and accept the change outcomes and the subsequent effects on their world. This process is characterised as change leverage and the process for identifying the leverage point here is the soft systems methodology.

Lewin (1951) identified that a person's behaviour (B) was a function of their personality (P) and their experiences (E) interacting together. He expressed this in a form known as Lewin's equation: $B = f(P,E)$. One of his most influential developments in this area was his Force-Field Analysis theory of change management, which provides a framework for looking at the drivers for change and the restraining forces. The change drivers were relatively easy to identify; however, the restraining forces were much harder to access as they were buried within the person's beliefs and values, described here as their worldview.

Lewin continued by explaining that people must be modelled as part of the change process and that the model must explain the actual learning and change mechanism. He asserts that no amount of information will persuade people to change if it does not match their own beliefs and values. This means that behavioural change requires an attitudinal change. Human systems cannot be treated objectively as they are a product of personality and experience. People need to apply their own method of reasoning to the process of learning and understanding. In dealing with change, people face the threat of disconfirming data. Lewin argues that they need a level of psychological

safety to be able to deal with the anxiety of change. A non-threatening forum for exchange of views, such as SSM can create psychological safety where change concepts can be accepted and where acceptance can provide a motivation for change.

In attempting to access the complex and often irrational ideas that make up a person's world view, Churchman (1970) applied systems thinking to these ill-structured, messy and subjective mind sets which constituted a range of *a priori* assumptions which may differ from person to person. He stated, "The systems approach begins when you first see the world through the eyes of another". Churchman identified that for proposed changes to be accepted and acted on by people, they had to work in the minds of the participants as well as in the real world. This leads to the need for the surfacing and identification of the range of worldviews of the participants and the development of a consensus or an accommodation of beliefs and values.

The skills and methodology required to address organisational change are those that deal with people, organisations, socio-technical systems and messy situations in an interdependent pluralist environment. This suggests the choice of Soft Systems Methodology as an appropriate tool for finding insights into ways to optimise change.

SSM allows for the raising of assumptions, the exploration of individual viewpoints, and a discussion of the various viewpoints, to give both expression and engagement to individuals. In this way, their views are considered in formulating a way forward.

4.3 Contemporary Change Strategies

Contemporary approaches to change management have been summarised by Nickols into four main strategies (Nickols 2007). These are described in Table 4.1.

Table 4.1 Contemporary Approaches to Change Management

Contemporary Approaches to Change Management
<p>Empirical-Rational</p> <p>People are reasonable and can be reasoned with, persuaded or induced by incentives to make changes, but the future has to be attractive and without risk or they will resist change, either overtly or covertly. Change is based on the communication of information and the offering of incentives</p>
<p>Normative-Re-educative</p> <p>People are social beings and will adhere to cultural norms and values. Change is based on influencing people by means of charismatic and dynamic leadership to establish new norms and values and adhering to them. This is basically a change in culture and requires a change in both the formal and informal organisation. It is appropriate for long-term goals but can be challenging for more immediate change.</p>
<p>Power-Coercive</p> <p>People are basically compliant and will generally do what they are told or can be made to do. Change is based on the exercise of authority and the imposition of sanctions. The type of culture within the organisation largely governs the success of this approach. A bureaucratic organisation will likely comply whereas a more autonomous culture could present significant resistance and precipitate position change and replacement.</p>
<p>Environmental-Adaptive</p> <p>People dislike disruption but they adapt readily to new circumstances. Change is based on the premise that people quickly adapt to new environments and once adapted they no longer oppose or resist change. A new organisation structure is developed and people are transferred to it. This may prove to be easier than trying to transform the old organisation.</p>

Source: Adapted from Nickols (2007)

None of the above approaches to change is a silver bullet but all seek to optimise the change effort. Managers introducing change are faced with a wide variety of issues, all requiring simultaneous attention. Few have the liberty of an extended time period in which to experiment or to gradually change culture. Also, organisations have a tendency for steady-state conditions and the maintenance of equilibrium. To be able to optimise change in terms of timeliness and efficacy, managers need to have an understanding of the present.

4.4 Optimising Change

Katz and Kahn (1978) identified the forces reducing human variability as resting in three main areas, namely:

1. Environmental Pressure
2. Rule Enforcement
3. Shared Values and Expectations

Environmental pressure is usually outside the control of the organisation. Rule enforcement is a discretionary power available to managers; however, shared values and expectations remain the challenge.

Very few managers have the intuitive gifts to read the inner world of the hearts and minds of their people. Managers need an interpretive tool that enables them to identify and understand the subjective meanings assigned to events by the social world in which they are working. Traditional reductionist approaches will not reveal the inner world as interpreted by different people. Nor will it explain their behaviour in a meaningful way. Systems thinking, and in particular, soft systems thinking, provides a tool for identifying mental modes and interdependencies that drive behaviour. It is a valuable tool for managing substantive change as it enables managers to select high yield leverage points of intervention for lasting results. It enables participants to see other worldviews that are beyond the boundaries of their own self imposed world.

4.5 Change Levers

Change levers are defined as those points of high yield that enable the change process to process beyond a blockage, or to take a quantum step forward in the change movement. High yield occurs when participants with pluralist values and beliefs reach genuine accommodation and compromise. It may also be a reappraisal of assumptions that leads to alternatives and initiatives not previously considered. A change in their thinking paradigm occurs. The high yield is a product of learning and understanding of other's viewpoints, experiences and interpretation of events that influences their behaviour.

Senge (2006) describes leverage as the economy of means: where the best results come not from large scale efforts but from small focused actions. To be successfully applied, these categories all need a depth of understanding of the mental modes of both the participants and of the manager.

Brill and Worth (1997) categorise change levers into four main areas:

- a) Human Factors
- b) Use of Power
- c) Social Process
- d) Leadership

Managers can be faced with significant difficulties with regard to the organisation culture that may not be adaptive to change. A culture with a high degree of shared values, visible cultural characteristics and a high regard for the organization's goals and leadership may adapt comfortably into a new world view. However, more frequently, these somewhat ideal conditions do not exist, or occur partially, and more skill and technique are required to get change started and keep it moving. Even organisations with strong high performance cultures may be averse to change. Brill and Worth's (1997) categories are discussed as follows:

- a) **Human Factors.** Of the four categories of change levers, human factors are the most sensitive and most complex and consequently the most difficult to manage. The way an individual's mind works and their perception of the way

the organisation works may not be rational. In effect, it may be quite emotive and subjective and may be full of contradictions and paradoxes. In seeking an understanding of participant's mental modes, managers cannot accept responses from participants on face value without observing actual behaviour and gathering information from multiple sources. Soft Systems Methodology can be applied to surface these hidden aspects of the organisations culture and individual's mental modes.

- b) **Use of Power.** Manager's use of power in intervention needs to be subtle. It can be used to produce alignment of processes and to control the sequence of events. Managers need to be well informed of the mental modes of the participants to prevent unexpected surprises in behaviour. Coercive power is not conducive to smooth change without the prior establishment of a critical mass of support for the manager's action.

- c) **Social Process.** The social process refers to the actual activities of the change process. This involves the relationships, interdependencies and dynamics of the situation and must also involve the feelings and needs of the participants. A primary step is the presentation and communication of clear goals. Many participants often suffer the effects of cognitive dissonance where they are confused by conflicting ideas and concepts. The manager's approach must appeal to both their intellectual and emotional psyche and so forge a consensus of opinion. This can foster the development of a belief system that supports the change process. Another component of the social process is the development and release of energy for change. By making people feel special, as experienced in the Hawthorne Effect (Mayo 1949), their energy and output can increase. The manager's role is to identify and unlock this energy by presenting an environmental crisis leading to change, by generating excitement and by using power prudently to facilitate the change process.

- d) **Leadership.** True leadership is an essential management skill for successful change. Apart from the basic leadership tenets of vision, articulation and persuasion, the manager must generate a vision in the eyes of the participants of clarity and a belief in the worthiness of change. This presupposes a level

of trust in the integrity of the manager for the vision to be credible. The manager's articulation of the vision needs to generate emotional energy and commitment through his communication. In addition to understanding the mental modes of the participants, the manager also seeks to stimulate innovation and creativity through the change process.

Managers need a technique that enables them to address the areas of human factors, power, social process and leadership that can provide a learning environment for both parties and subsequently affect leverage of the change process.

4.6 A Systems Approach to Change

The need for a greater understanding of the behavioural environment in organisations in which change occurs or is proposed, predicates a pluralist approach. Managers have a set of core beliefs and assumptions developed over time, both within and outside the organisation. These mental modes may or may not be shared by the participants. Managers may take for granted that all participants share assumptions about the business environment. The individual participants can have a diverse range of mental modes and world views, as discussed above.

Most organisations consist of groups of people that form social systems. Some portions, relating to the organisation's structure produce formal systems whilst others within the system make up informal groups. The formal group has a clear boundary that is analogous with the organisation's boundary. The boundary of the informal systems may be ill defined or invisible. The informal group, or sub-system, may have relationships, dependencies and beliefs that differ or conflict with the formal group. Moreover, sub-cultures exist in differing parts of the organisation, such as the professional sub-culture, the administrative sub-culture and the customer interface sub-culture. People's behaviour is implicitly linked to their culture, represented by their beliefs and values, so a change in behaviour implies a change in culture. Desired change then requires an acceptance and absorption of changes to the organisation's culture.

The use of Soft Systems Methodology provides an approach for the application of change management to messy, complex and people based organisational challenges. Its pragmatic, open system approach allows for the inclusion of subjective information as well as objective facts. It allows unconstrained thinking and problem solving to take place in the development of a desired future in a pluralist environment through a highly iterative and interactive process. It encourages participants to accept multiple worldviews of the situation.

The construction of the Rich Picture provides a structured way of gathering data, impressions, concerns, relationships and dependencies such that the manager, as change agent, has an enhanced understanding of the present situation. It can also highlight wider cultural and organisational issues that can inhibit proposed change.

From the Rich Picture, root definitions and conceptual models can be developed to express the situation in systems terms, showing possible futures, dependencies and relationships.

4.7 Summary

This chapter discusses the application of change theory to contemporary organisational change situations. It introduces the concept of change levers and discusses the four areas of change where high yield may be achieved. There is emphasis on human factors as a significant change lever. It also argues for the application of SSM as a technique for surfacing and including the subjective elements of participant's mental modes, as a means for managers to develop a culture adaptive to change.

Chapter 5: Research Methodology

5.1 Introduction

The previous chapter considered the theory associated with organisational change and its application in real world situations. It also identified some of the limitations of the attempts to implement change.

The need for an understanding of the complexities and vagaries of the change process in large organisations has led to the notion that an empirical investigation of the process could lead to a more enlightened approach to change, providing new knowledge which in turn could lead to an enhanced and timely process of change.

This chapter describes the process of selecting a research methodology. It discusses the ontological and epistemological basis of the study methodology and considers issues of data interpretation, validation and ethical considerations.

5.2 Research Paradigm

The ontological approach adopted for the research is described primarily as Interpretivism. Blaikie (1993) describes Interpretivism as a mode of social enquiry in which the social actors negotiate the meaning for actions and situations. As the actors hold individual beliefs and values, he describes the social reality as being preinterpreted. Giddens (1993) also argues that the researcher generates descriptions of social conduct which depends upon the frames of meaning the actors themselves have in constructing their social world. The interpretivist approach emphasises an understanding of human behaviour and actions. It assumes that knowledge of reality is only gained through social constructions such as language, consciousness, shared meanings, documents, tools and other artefacts (Klein and Myers 1999). Interpretive research is not *a priori* and does not predefine dependent and independent variables, instead the focus is on the complexity of human sense-making as the situation emerges (Denzin and Lincoln 2005). It attempts to understand phenomena through meanings that people assign to them and through processes where the information system influences and is influenced by the context. This process can also be

described as phenomenology in as much as it is the study of the way individuals actively create their own world through their own consciousness.

The associated epistemological strategy is to enable the researcher to obtain the socially constructed meanings of events in the process under study.

Some portions of the study may also be seen as Realist. This ontology is described as one where a distinction is made between the domains of the empirical, the actual and the real. The empirical being made up of experience of events through observations, the actual includes events that happen and the real consists of the process that generates those events (Blaikie 1993). The epistemology of this approach is based on the building of system models that illustrate the social construct and reveal the underlying mechanism of reality which control or influence the behaviour of the social entity.

5.3 Choice of Soft System Methodology

Soft systems methodology provides rigour to research as it has an explicit methodological framework for developing new concepts. It deals with real world problems; however, the thinking is applied systemically to model ideal concepts that are then debated to find accommodations of viable action for change. The learning is generated by considering what is, then what could be, and by adopting new perspectives of problem situations. The process allows the participants to find out about their beliefs and values as they impinge on the problem situation. Assumptions about how to proceed are also raised and challenged. This learning process leads to changes in thinking and behavioural patterns. With an accommodation reached, participants are able to resolve problems quickly as behavioural, cultural and value constraints are reduced or ameliated, so affecting a leverage of the change process.

The strength of SSM is that it can deal with emergent properties and abstract ideas. It also provides structure and control, with comparison to the real world as a benchmark. When applied to human activity systems, it correlates activities to make a purposeful whole. As a learning process it uses iteration to examine real world situations through human activity.

5.4 Research Design

In adopting a methodology for the study of complex systems, a quantitative approach would necessarily involve the collection of concise data pertaining to some or all of the elements of the system. This may then be followed by an algorithmic approach to synthesis of the data. The difficulty here is that many systems dynamics and systems characteristics are of an intuitive, sensory or qualitative nature and may not be readily measured or recorded in quantitative terms, nor can they be readily synthesised in an algorithmic format. Consequently a quantitative approach is rejected.

A qualitative approach using heuristics such as learning approaches can prove to be more effective. As Checkland (1981) observed, “A systems researcher will give an account of the world, or part of it, in systems terms; his purpose in so doing; his definition of system or systems; the principle which makes them coherent entities; the means and mechanisms by which they tend to maintain their integrity; their boundaries, inputs, outputs, and components; their structure”.

Checkland (1991) further stresses the importance of defining the methodology in advance of undertaking the research. He argues that it is essential to declare the framework of ideas and the methodology in which they are embodied so as to provide a conceptual separation of theory and practice. This is illustrated in the diagram in Figure 5.1.

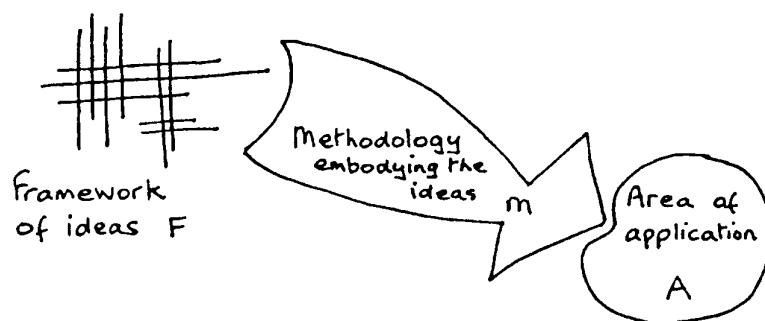


Figure 5.1 A Basic Conceptualisation of Intellectual Work. Source: (Checkland and Scholes 1998)

Checkland and Scholes (1998) describe the process as iterative learning where experiences are fed back to clarify and enhance the intellectual framework, providing

a holistic rather than reductionist approach. This in turn leads to the enhancement of rich pictures models that are discussed later.

According to Mason (1996), qualitative research should produce social explanations to intellectual puzzles. Individuals have personal thoughts, feelings and knowledge that contribute to their beliefs and values, and ultimately to their actions and their decision making processes. In the area of organisational change, this contributes to a source of variation both at the personal and collective level.

Sarantakos (1998) provides further argument for the use of qualitative research:

- When the standard of knowledge in the area of the research subject is inadequate and provides no sound basis for a quantitative study, for example, for defining the research question, familiarising oneself with the research environment, operationalising the variables, and so on, the qualitative research takes here the form of an exploratory study.
- When there is a need to study reality from the inside rather than from the outside, that is, to understand it from the point of view of the subject.
- When the study object is too complicated and complex and a quantitative method is of little use. It is argued here that quantitative methods are simplifications of the qualitative methods, and can only be meaningfully employed when qualitative methods show that a simplification of identified relations is possible. Consequently, an exploratory qualitative study can provide clues about the research environment and the issue in question, and can on the one hand make quantitative research possible, and on the other guide it towards more realistic goals.
- When there is a need to capture reality as it is, ie, in interaction.
- When the researcher intends to present the information gathered, not in numbers or formulae, but rather, verbally in a detailed and complete form.
- When the researcher wishes to approach reality without preconceived ideas and restructured models and patterns.
- When the investigator perceives researcher and researched as elements of the same situation and the research process as a whole unit.

- When the researcher wishes to capture the *meaning* and the regularities of social action.

From Sarantako's view of the interpretive perspective, we can conclude that for people to understand social events, we need to explore what it means to them and how they make sense of the events in their lives. People's response to an event relies heavily on their understanding and interpretation of the meaning of the event. Furthermore, Weber (1846-1920) made a major contribution to understanding human behaviour by emphasising *verstehen* or the empathic understanding of human behaviour. He also extended this concept to *sinn-verstehen* that incorporates meaning with understanding.

The researcher's experience supports the views discussed above in that previously latent ideas, views and concerns can be considered and interpreted in the context of the system under consideration. Each case studied proved to be a different journey where the requirements of the study were not pre-emptive. Qualitative research design satisfied the research requirements in each case.

5.5 Research Assumptions:

The assumptions made in the design of this study can now be expressed as follows:

Ontological assumptions (Concerning the nature of the world and people in a social context):

- Reality is not objective, but is subjective.
- The social world is created by people assigning meaningful systems to events.
- These meanings are derived from people's social interaction with each other.
- The meanings may be interpreted or modified as people interact with events.
- Events are dynamic and interpretations can also be dynamic.

Epistemological assumptions (Concerning the ways of acquiring knowledge):

- There is not a single clear view as to how to proceed with change, consequently the situation is characterised as pluralist.
- Solutions cannot be expressed as simple rational models, consequently they are characterised as complex.

- Situations admit to a number of explanations simultaneously.

Methodological assumption:

- An abductive interpretive approach will draw meaning and understanding from observations and interviews of participants.

In selecting qualitative research for this study, the assumptions above hold that there may be different realities perceived by those involved in change events and that those realities benefit by interpretation rather than by measurement. Qualitative research pursues the process of exploration and discovery rather than measurement and confirmation of a predetermined hypothesis.

Consequently, qualitative research has been selected as it allows the participants or actors in the study to express their opinions, their emotions and their feelings, and so provide an expression of their social meaning. This provides an insight into their interpretation of the meaning of events and subsequently, the likely responsive behaviour during the dynamics of change.

The general assumption of Checkland's SSM is that people's view of the world is subjective and that by debate, discussion and expression of their views, an accommodation or mutual consensus can be reached.

The assumption of this study is that having reached an accommodation of views, all parties are willing to commit to change without further resistance or obstruction. This is the area of new knowledge in the application of soft systems methodology. The participants describe their social structure from multiple perspectives, they seek to read and understand the perspective of others and through learning they break down the polarisation that inhibits progress towards change.

The assumption relating to the data is that the case studies chosen are representative of a wide range of real world situations. By sampling such a range of cultures from business, manufacturing and the community, the contribution made by this knowledge is widespread and can benefit many organisations throughout Australia.

The assumption relating to the researcher is that the study will be conducted impartially and will faithfully report the observations and the information received. This position will enhance the validity and reliability of the data collected.

5.6 The Application of Case Studies

Yin (2003) defines the scope of a case study as an empirical inquiry that investigates contemporary phenomena within its real-life context especially when the boundaries are not clearly defined. This definition leads to the application of case study research as an applicable methodology for the interpretivist paradigm. Yin also argues that case study methodology has been found to be the preferred strategy when the investigator has little control over events and when the focus is on a contemporary phenomenon within some real-life context. Table 5.1 outlines a framework to examine the applicability of different research strategies.

Table 5.1 Relevant Situations for Different Research Strategies

Relevant Situations for Different Research Strategies			
Strategy	Form of research question	Requires control over behavioural events?	Focus on contemporary events?
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archival	Who, what, where, how many, how much	No	Yes/No
History	How, why	No	No
Case study	How, why	No	Yes

Source: (Yin 2003)

Yin (2003) argues that case study methodology relies on many of the same techniques as a history, but adds two sources of evidence not usually included in the historian's repertoire: direct observation and systematic interviewing. To overcome the view that case studies have been considered as a less desirable form of inquiry than either experiments or surveys, Yin further argues that rigour should be built into the process to ensure that equivocal evidence or biased views do not influence the direction of the

findings or conclusions. For this purpose Yin has devised a framework for undertaking case study research and this is presented in Table 5.2.

Table 5.2 Process of Building Theory from Case Study Research

Process of Building Theory from Case Study Research		
Step	Activity	Reason
Getting started	Definitions of research questions Possibly 'a priori' constructs Neither theory nor hypothesis	Focuses efforts Provides better grounding of construct measures Retains theoretical flexibility
Selecting cases	Specified population Theoretical sampling	Sharpens external validity Focuses efforts on cases that replicate or extend theory
Crafting instruments and protocols	Multiple data collection methods Qualitative and quantitative data combined Multiple investigators	Strengthens grounding of theory by triangulation of evidence Synergistic vies of evidence Fosters divergent perspectives and strengthens grounding
Entering the field	Overall data collection and analysis Flexible and opportunistic data collection methods	Speeds analysis and reveals helpful adjustments to data collection Allows investigators to take advantage of emergent themes and unique case features
Analysing data	Within-case analysis Cross-case pattern using divergent techniques	Gains familiarity with data and preliminary theory generation Forces investigators to look beyond initial impressions
Shaping research questions	Replication, not sampling, logic across cases Search evidence of 'why' behind relationships	Confirms, extends and sharpens theory Builds internal validity
Enfolding literature	Comparison with conflicting literature Comparison with similar literature	Builds internal validity Sharpens generalisability
Reaching closure	Theoretical saturation when possible	End process when marginal improvement becomes small

Source: (Yin 2003)

Yin suggests that the process outlined provides a logical methodology for not only the conducting of case study approaches but also their description and analysis. In particular, the 'how' and 'why' questions strongly favour the use of the case study methodology.

The application of case study strategy in this research is to identify and explain the causal

links in interventionist change that are too complex to explain by surveys or hypothesis and to reveal insights into the meaning of reality for the participants. The approach proposed by Yin was used and further developed to suit the situation under study.

5.7 Data Analysis Approach

In a qualitative research, data analysis often occurs simultaneously with data collection, data interpretation, and narrative report writing. According to Denzin and Lincoln (2005) in qualitative analysis several simultaneous activities engage the attention of the researcher: collecting information from the field; sorting information into categories; formatting the information into a meaningful story or model of the event; and actually writing the qualitative narrative report. In qualitative research, the researcher takes a voluminous amount of information and reduces it into meaningful categories, patterns or themes and then interprets the information. Flexible rules govern how one goes about sorting through interview transcripts, observational notes, documents and visual material (Creswell 1994).

Mason (1996) stated that the intent of qualitative research is not to generalize findings, but rather to form a unique interpretation of events for a given group of individuals or institutions, within a given context, at a particular point in time. The uniqueness of the study within a particular context mitigates against replicating the research exactly in another context. After collecting data from a representative sample, the next step is to analyse the data so that the research questions can be evaluated and tested.

However, according to Sekaran (2003) before this can be done some preliminary steps need to be completed. These steps help to prepare the data for analysis, ensuring that the data obtained is reasonably good and allow the results to be meaningfully interpreted.

Figure 5.2 shows these steps and identifies the four steps in data analysis as (1) getting data ready for analysis, (2) getting a feel for the data, (3) testing the goodness of data and (4) testing the research questions. The analysis portion of the diagram

covers both qualitative and quantitative research methods. In the case of this study, the feel of the data is verified by benchmarking it against the other case studies conducted by the researcher in commercial studies.

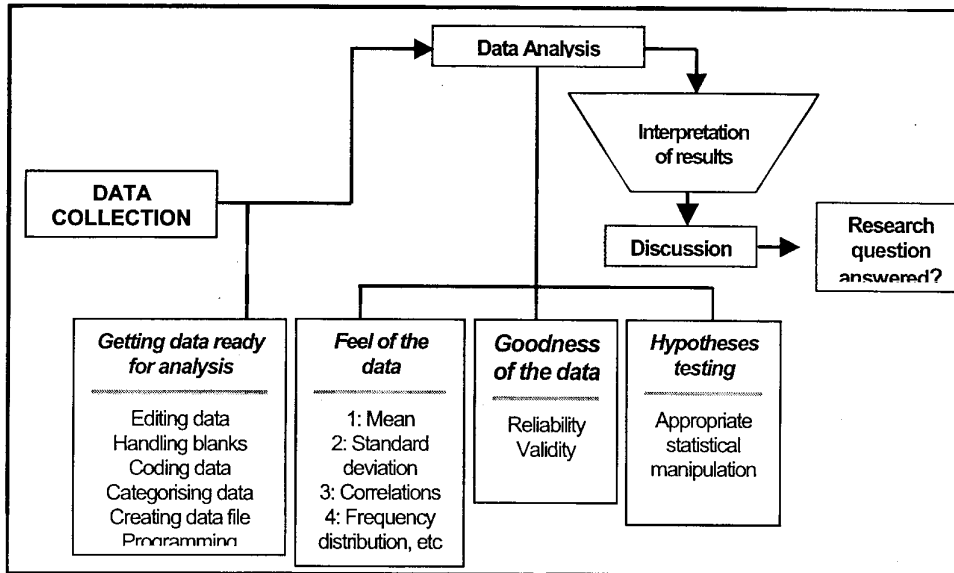


Figure 5.2 Flow Diagram of Data Analysis Process. Source: Sekaran (2003)

As the process of analysis of the data also involves the development of relationship and dependency links, ‘rich pictures’ were utilized to identify and extract meaning from the participant’s responses.

5.8 Data Gathering by Interviews

Data for the study was gathered by two primary means, by interview to gather verbal data and by observation to gather behavioural data. The interview process used is the semi-structured interview process, which is utilized to give a frank open and interactive mode of communication. According to Yin (2003), interviews are the most important source of information. An interview can be defined as a purposeful communication and interaction between two or more people who are in the process of conversation and negotiation for a specific purpose associated with some agreed subject.

In this case, it is exploring the research questions and is used to generate and collect data. The interview was the main exploratory tool of the researcher and was used to gain a systematic knowledge of the social rhetoric under investigation. Conversations held contained a mixture of revelation and inferences, and no doubt some concealment of thoughts and intentions. To sharpen the reliability of the data collected, the researcher used reflective questioning techniques to add credibility to comments made.

Throughout the interview process, the participants were assured of confidentiality and were encouraged to voice their opinions, express their concerns and explain their understanding to the issues being discussed.

As the researcher has had considerable experience in interviewing techniques in both the consulting and recruitment industries, pilot studies were considered superfluous in this case. Tape recording of interviews was considered but rejected on the basis of obtaining frankness from participants. The researcher's earlier experience with tape recording was disappointing and proved to be a distraction to the participants. The need to listen carefully and intently was enhanced by the lack of a recording device. All interviews were recorded manually in a journal. Simple techniques to encourage frankness were employed, such as asking for comment on positive and successful actions and events. This technique usually elicited an equal number or more negative attitudinal responses, which gave a greater insight into the research issues. Where the respondent made inferences to a condition or state of affairs, the researcher sought confirmation of the inference. The research also posed questions to himself and asked the respondents to help him understand the answer.

Restating or paraphrasing responses and seeking confirmation, either by word or gesture, employed reflective listening. Visual signs of communication and body language were noted and recorded. One of the benefits of the case study approach is the opportunity to include non-verbal responses. A gesture of disapproval can be pursued with further questions to find the root issue concerning the participant. The researcher found the use of diagrams and sketches, in some cases, to be of benefit in explaining links or relationships. In pursuing the interpretation of some issues, the researcher was able to put the questions back to the participant in different forms, to solicit a more detailed

response. The researcher's approach to avoiding bias was to focus on the participant's experiences rather than the person.

5.9 Reliability of Data

According to Yin (2003), the reliability of case study data can be enhanced by adopting a case study protocol which provides a framework for the fieldwork, in this case, the interviews, and acts as a procedural guide. The following protocol, shown in Table 5.3, was developed for this study. The protocol provides structure and formality to the fieldwork. A level of reliability can be achieved by ensuring all key issues are addressed and problems resolved.

Table 5.3 Case Study Protocol

Case Study Protocol	
1	Establish theme for the interviews
2	Set a schedule of visits and verify access
3	Determine people to be interviewed and alternatives where unavailability exists
4	Obtain organisation chart of target group or company
5	List resources required for interview or observation
6	Arrange introductory presentation and explanation of SSM process to participants
7	Develop semi-structured questions and range of open questions
8	Develop key topic shell or check list for 'must have' answers
9	State assurances on confidentiality of data level of responses to be given to participants
10	Identify collaborative data and elements of influence outside the boundary of the study
11	Draw inferences and conclusions from data
12	Write up meaningful conclusions

5.10 Validity of Data

Validity can be defined as the level to which the data being collected is a true picture of what is being studied (McNeil and Chapman 2005). As the data collected in this

study is by direct interview and observation of individuals participating in, and undergoing dynamic change processes, as distinct from indirect surveys, the data can be considered to be valid with a high degree of certainty. The answers and responses given to the interview process can be accepted as a true picture of the world as seen by the interviewees. The unstructured portion of the interview whereby the respondents were encouraged to give open and frank responses also enhanced validity. Occasionally, unexpected and unusual responses were forthcoming which revealed new ways of thinking in terms of the research issues.

5.11 Representativeness of Data

The organisations chosen for the case studies are from a wide range of social sources. They include education, local government, large unionised organisations, manufacturing and service industry. By selecting a broad range of people from differing industries and social settings, the researcher argues that the results and conclusions drawn from this study give a complete picture of the social phenomena studied and that the insights gained can give relevant meaning to other people and other organisations undergoing change.

5.12 Development of Qualitative Systems Models

A distinction needs to be made between qualitative and quantitative models. The term "qualitative" may seem inappropriate as applied to models, but it is not. Diagrams and pictures, said to be "worth a thousand words", are clearly models. Also, a verbal description of a real event is a kind of model. Qualitative models can be highly precise and rigorous in expressing certain types of information. A classic example is the famous periodic table of the elements, developed by Mendeleev (1834-1907). It is clearly a model and definitely qualitative as there are no measures involved. The concept of abstracted systems becomes important in considering systems, as it highlights the importance of the interaction or interrelation of the elements of the system.

A model is defined as a representation of a system for the purpose of studying the system. For most studies, it is not necessary to consider all the details of a system; thus, a model is not only a substitute for a system, it is also a simplification of the system. On the other hand, the model should be sufficiently detailed to permit valid conclusions to be drawn about the real system. Different models of the same system may be required as the purpose of investigation changes (Banks and Carson 1984). Primary considerations in developing models are the features and/or behaviours to be represented and the quality or accuracy of the representation.

Also, Paul (1998) explains that models are not necessarily static or void of activities. Physical models may possess several of the dynamic characteristics of the real systems they portray. The difference, however, is that the former is used for representation and for information gathering and exchange purposes and not the actual systems they operate.

5.13 Ethical Considerations

In order to achieve an acceptable standard of ethics and scholarship, this study attempts to be professional and responsible in the following way:

- It will use appropriate means to gather data.
- It will involve informed consent.
- It will be careful to avoid any level of deception.
- It will be carefully interpreted.

To achieve this outcome, Sarantakos (1998) offers a table, shown below in Table 5.4, in which the ethical relationship between a researcher and the participants are defined. These relationships were followed in this study.

Table 5.4 Ethical Standards for Researcher-Respondent Relationships

Ethical Standards	Description
Proper identification	<i>Codes of ethics suggest that the researcher should identify himself to the respondent and avoid giving false impression of the researcher or the project</i>
Clear outset	<i>Researchers should inform the respondent of the types of questions, the degree of question sensitivity and the true consequences that the questioning and the research might have on the respondent</i>
Welfare of the respondent	<i>The researcher should always be concerned with the welfare of the respondent, including mental and physical health and safety. The researcher should avoid questions or issues that may cause embarrassment, guilt, risks or discomfort to the respondent.</i>
Free & informed consent	<i>Respondents should participate in the research freely and not be pressured to do so or deceived in any way. They should also be fully informed about the nature and goals of the study before being asked to take part in it.</i>
The right to privacy	<i>Researchers should respect respondent's privacy when entering their private sphere and when asking questions, and should allow respondents to leave unanswered questions for which they do not wish to provide a response.</i>
The right to anonymity	<i>Data collected by the researcher should be anonymous, that is, not related to names or other forms of identification</i>
The right to confidentiality	<i>Information offered by the respondents should be used by the researcher only, and only for the purposes of the study. It should not be made available to other people for any purpose.</i>

Source: Sarantakos (1998)

The research process followed required an initial explanatory statement that identified the researcher and the university, the purpose of the study, the type of information required and the level of privacy to be assured. As interviews and observations would involve individuals, a level of trust and openness was required.

The establishment of trust started with the obtaining of written consent from the participants. To constitute informed consent, the participants need to know what the research is about and how the end results are to be used. As sociological research is intrusive and considers what people think, it was important to ensure the participants that their identities would remain secret. It was also considered important to assure the participants that they would not be asked to provide any incriminating or personally compromising information. They would not be subjected to induced stress and would not be put in embarrassing situations. As tape recording of the interviews was rejected earlier, the individuals were assured the only record of conversations

were the researcher's written notes. All participants were informed of their right of withdrawal from the interview process.

The privacy of the individuals would also be respected once the information obtained was in its published form. There would be no identifiers and the information would not be used to support decisions made about the individuals.

5.14 Limitations of the Study

It is recognised that another researcher interviewing the same or different participants may produce differing results as there is a high degree of subjectivity and relativism in the research process. In this sense, the study may not be replicated. However, the process is not deterministic and does not seek to find the one true answer but to uncover unseen dimensions of the world of the participants and to achieve insights into the application of soft systems methodology in leveraging change. Also, as participants were from different industries, the scope for benchmarking and triangulation of the findings by industry was limited.

5.15 Summary

In this chapter, the researcher has outlined the philosophy adopted and the methodology used to gather data. The rationale for choosing qualitative research, and in particular, the interview method, was justified and an interview protocol was provided. Matters of reliability, validity and representativeness were discussed along with ethical concerns. Limitations have been identified and the process has been presented as transparently as possible to ensure its integrity.

A tabular summary of the research philosophy and research direction are given in the following Table 5.5:

Table 5.5 Summary of Research Design

Research Philosophy	Research Direction
Research paradigm	Interpretive
Research experience	Industry
Research design	Qualitative
Research assumptions	Ontological – Subjective reality Epistemological – Multiple worldviews Methodological – Abductive interpretive
Research strategy	Case studies
Data analysis	Interpretive diagrams
Interview technique	Semi-structured
Data reliability	Case study protocol
Data validity	Participative research
Representativeness of data	Five different industry studies
Qualitative models	Root definitions of systems
Ethical approach	Ethical standards respected
Theoretical framework	Soft systems methodology

Part II Case Studies and Results

Part II is the empirical and analytical section of the thesis. It commences with the detailed information gathered through the process of interview and observation with the people involved in the SSM groups in each of the selected case studies. Results are discussed and analysed. Finally conclusions are drawn from the results obtained.

Chapter six provides a discussion of the background of the five organisations studied. It provides the reason for, or driver of change, the major barriers identified and the approaches used to elicit information, the interviews and observations, a rich picture of the process illustrating the barriers identified, the root definitions developed, the conceptual models generated from root definitions, the comparison of the conceptual model with the real world situation, the attitudinal change, structural and procedural changes required, the lessons learnt and the points of leverage identified. The process of consideration of the case studies is explained in more detail in the first case study.

Chapter seven is a discussion and presentation of the results of the investigations. The chapter discusses the application and efficacy of the model used with comment on its reliability. It also includes a consideration of the limitations of the method and characteristics of the facilitation of the process.

The final chapter, chapter eight, discusses the overall conclusions of the study, the contribution to the body of knowledge, practical implications for the new knowledge and the limitations and constraints encountered. Lastly, opportunities for further research are considered.

Chapter 6: Case Studies

6.1 Introduction

Data gathering in the case studies was by means of semi-structured interviews and by observation, or by discussion with participants in SSM groups. As a guide to the interview process, a list of discussion questions was used, based on the research questions. The research questions are restated below:

1. *Can the rate of change, in an organisation be leveraged by intervention, when applying leverage points identified in a soft systems approach.*
2. *Can the means of optimising change in organisations be identified and modelled consistently by this research, using a soft systems approach.*
3. *Will the system models developed be applicable across a range of real world organisations and cultures with a diversity of thinking?*
4. *What will be the level of influence of existing systems climate and boundaries on the effectiveness of the models in leveraging change?*

To provide a level of consistency and reliability to the interview process, the following Table 6.1 of discussion questions was used in each interview.

Table 6.1 Discussion Questions

Discussion Questions
1. Define the nature of the organization, its boundaries, any dominant subculture, and any precedents affecting its behaviour.
2. Does the organization have any change constraints in terms of abilities, skills or knowledge?
3. Are there any structural or systems changes made to facilitate change?
4. What were the issues or events that became change drivers? Were they push or pull drivers?
5. What relationships were required for the organisational change process to take precedence over the interests of individuals?
6. What change model, theory or practice was used?
7. What was the outcome of the change process?
8. What were the points of leverage of the process?
9. What hidden barriers arose from the process?

The five case studies considered were chosen on the basis of both a diverse range of human activity systems and access to the participants, processes, procedures and systems of the organizations concerned.

6.2 Case study No. 1: A Municipal Authority

6.2.1 The Problem Situation – Unstructured

Local municipal authorities in Victoria are democratically elected authorities for the governance and management of their district. They are a subsidiary part of the Victorian State Government and are the responsibility of the Minister for Local Government. Traditionally they had existed in every major town or city. They operated from the town hall and provided a range of municipal services. The elected representatives are known as councillors and the municipal bodies are known as councils in urban areas and shires in rural areas. The councillors sit on a number of committees which focus on the management of a range of services such as town planning, refuse collection, health and home services, road maintenance, parks and gardens etc. The committees are supported in turn by full time specialist departments, each with its own manager answering to the chief executive officer.

As municipalities and populations grew, some towns developed and some diminished creating an imbalance between neighbouring bodies. Their capacity to generate income and the extent of their services was linked directly to their municipal boundaries. Many offered duplicated and conflicting services or were unable to offer the depth of services called for by the communities.

Development and maintenance work was generally conducted on a cost plus basis resulting in municipal charges being increased to cover costs. Many incidences of questionable governance had occurred. Also some had become petty fiefdoms of power where a personal relationship with the Mayor or other elected officials was required to get things done, rather than through the management channels. This created a conflict of authority whereby the councillors would approach employees directly with work requests. Many employees considered that they had a well-paid job for life, had never experienced any significant change and had no incentive for cost reduction, timeliness or efficiency.

In recent years, the advent of a newly elected State government was the catalyst for structural and cultural change. The new state government forced amalgamation of two, three or so smaller municipalities into larger bodies, dismissed all elected officials and appointed temporary administrators, recruited new chief executives and decreed that rate revenue be reduced by 20%, and that work be conducted on the basis of compulsory competitive tendering. Projected savings across the state were expected to be \$100 million. A large number of the elected councillors and the municipal employees were of a different political persuasion to the new government and resented the changes in their circumstances with some hostility. The government countered this by appointing competent administrators and by delivering a positive supportive attitude to change.

6.2.2 Characteristics of the Changes

These changes had a wide ranging effect on the local culture as well those employed by the municipalities. In rural and semi-rural areas, the local municipality provided a sense of identity for the community. In many cases, the centre of government, ie the town hall, was moved to another location, usually to a bigger town. This resulted in feelings of stress, anger and bewilderment among the community, and in particular, the employees of the municipality.

As in almost every case of amalgamated municipalities, there was a new chief executive, a series of redundancies of ineffective and surplus staff and the appointment of new young and sometimes inexperienced employees. The municipality under study, a rural district, covered a new amalgamated area of almost 4000 square kilometres, included 29 towns and had a population of 12,000 people. The restructured staff consisted of around 100 employees plus 70 part-time and voluntary workers.

The primary and most immediate task of the new council was to recapture their traditional work, which was source of employment for the majority of their blue-collar employees. This was now to be achieved by open competitive tendering, as prescribed by new legislation. These workers were now exposed to the uncertainty

and risk of the tendering process. Most had diverse levels of education and were unaccustomed to thinking or contributing ideas about their tasks. There had been no investment in development of skills or knowledge of this part of the workforce.

Two positive initiatives occurred as part of this change. Workers were freed from pressure and harassment by the elected councillors for the enactment of work or favours for individuals. All work orders now came strictly through the management system. Councillors and administrators were no longer permitted to approach staff with work requests. Their directive was to 'Do the steering, not the rowing'. Secondly, workers were offered opportunities to improve their knowledge and skill, and six employees had immediately taken up the offer of further education. The influence of the councillors had changed but they still had to answer to their constituents and also deal with higher-level political issues that impinged on their profile. This resulted in areas of discomfort for the councillors. Moreover, councillors were surprised at the lack of outrage and disapproval on the part of the community. This was mostly a result of the 20% rate cut and disillusion with the excesses of the previous government. Under these circumstances, it was a positive time for change.

In terms of system change, all staff were now more exposed to systems processes and to process improvement. All operations were more process oriented with an emphasis on probity of accounting and stewardship of resources. There was a realisation that employees needed to take responsibility for outcomes and desire to improve efficiency so that they would win tenders for work on the open market.

Improvements introduced by the chief executive were very much in the 'pull' category. The concepts of quality management, service capability, leadership development and clear communication lines were introduced with positive results.

A significant change in the internal influence of councillors was noticed. Historically, many individuals sought positions on the council so that they could exert power and influence over the use and distribution of municipal funds and resources, either as a direct or indirect influence on their business dealings. Others saw the position of councillor as a pathway to a political career and tried to introduce party politics into their municipal role. As a result of the changes, former councillors became impotent

and newly elected councillors had access to the chief executive only. Some resistance was mounted by councillors to this situation, however it was relatively ineffective.

Under the new all imposing reforms for local municipalities, the government administrators appointed the new chief executive, and in this case, a woman. The chief executive in turn selected and appointed divisional directors and they in turn recruited their own selection of employees. This gave the managers an immediate strategic advantage of having more control over the workforce that they selected and groomed for themselves. In some areas, however, the change process did not go so smoothly. In one of the towns that had previously been independent, a dichotomy of mindsets arose. Eventually all disaffected staff resigned, whilst the remaining staff, which had in effect won the day, had a very positive attitude. Encouraging and accepting new ideas from them reinforced this attitude. A new culture developed that could accept bad news but not cover-ups or undisclosed information.

The requirements of change in this case were set by legislation. Some interruptions to works and municipal programs occurred, however, the burden of change lay squarely with the employees, both former and present. The organization was able to maintain an adequate degree of stability, enhanced by the long serving administrators who acted as board of management, and by retaining or hiring capable and experienced staff in the engineering and finance areas.

No specific model or theoretical approach to change was employed, as the enactment of the legislation resulted in a form of coercive change which started with the dissolution of existing councils, the appointment of administrators and the hiring of new management and staff. The main driver of process change was the need to become successful at competitive tendering. To facilitate and improve this process, the chief executive introduced training and practice of quality management and process mapping. The executive made it clear by words and actions that they were prepared to invest in the development of a highly skilled and competent staff. Management's approach was to adopt the attitude that "positive outcomes are attainable". Milestones and deadlines were set, a business unit established, process improvement teams were set up and the teamwork approach strongly encouraged contributions from employees.

Many difficulties were encountered. The municipality had recently introduced a new computer based management system and many of the staff and some managers who had little exposure to computer systems were very slow to adapt. In the works and services area, employees were accustomed to the hierarchical authority structure, and so responded accordingly, however, the nurses acting as a team proved difficult. As health workers, they had a strong sense of professionalism and self worth. They had been accustomed to working independently, with a sense of moral equity and a degree of unquestioned authority. They were now required to work within the organisation's structure and to accept work through the proper channels.

Other difficulties related to differences in the level of urgency of jobs. This created tensions that slowed down the processes. Other process bogged down where overall direction was not clear. The general observation was that some people would put obstacles in the path of change, slow down or undermine the system if the changes were not immediately important to them. A case in point was the new staff induction program. Many people tended to ignore this until something occurred that affected them. There was a marked contrast between this program and the compulsory tendering process that affected everyone and was important to all.

The process of change was initiated by setting up a series of workshops, initially to introduce the soft systems methodology, then to provide a forum for discussion and debate of the root definitions and ultimately to analyse the desirability and feasibility of the new concepts.

6.2.3 The Enquiring Process That is SSM

The process of enquiry followed in the case studies is informed by the approach outlined by Patching(1990) which follows the steps of enquiry, modelling and desirable outcomes in a cultural and practical real world and is illustrated by the following Figure 6.1.

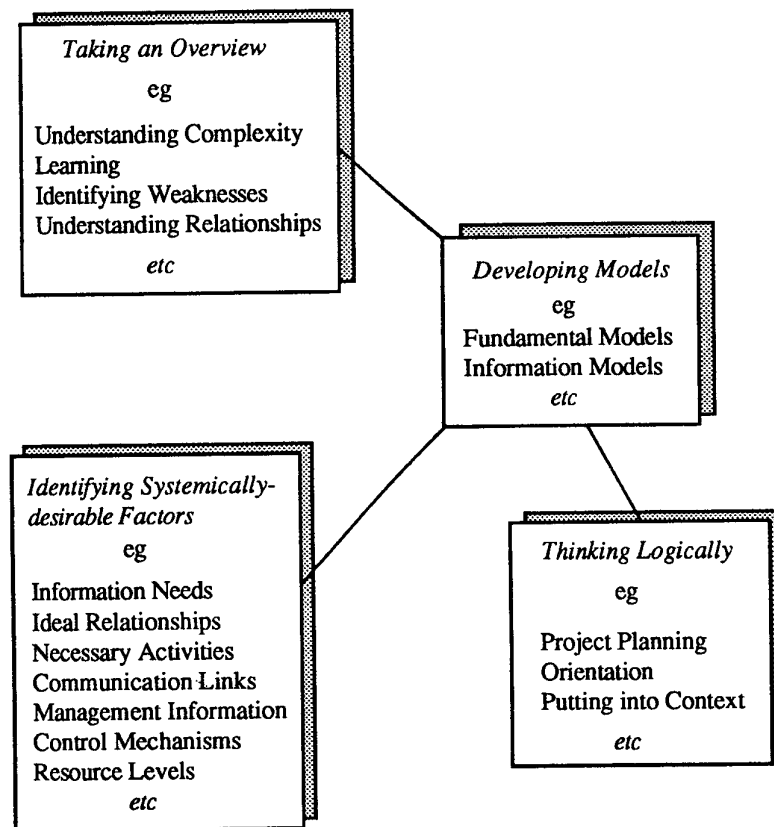


Figure 6.1 The Soft Systems Analysis Approach Source: Patching (1990)

The first step is to explore and understand the situation, followed by expressing the unstructured situation in a Rich Picture. Rich Pictures are pictorial representation of a messy problem situation. They include a range of elements such as opinions, concerns, conflicts, constraints as well as business processes and structural arrangements. Checkland (1998), who developed the concept, provided guidelines that suggest they should include structure, processes and issues and concerns. In this way the rich picture provides an analysis of the situation. The following illustration is the rich picture of the amalgamated municipal council as shown in Figure 6.2. Here a

conflict is shown as crossed swords and an amicable arrangement is shown as a handshake.

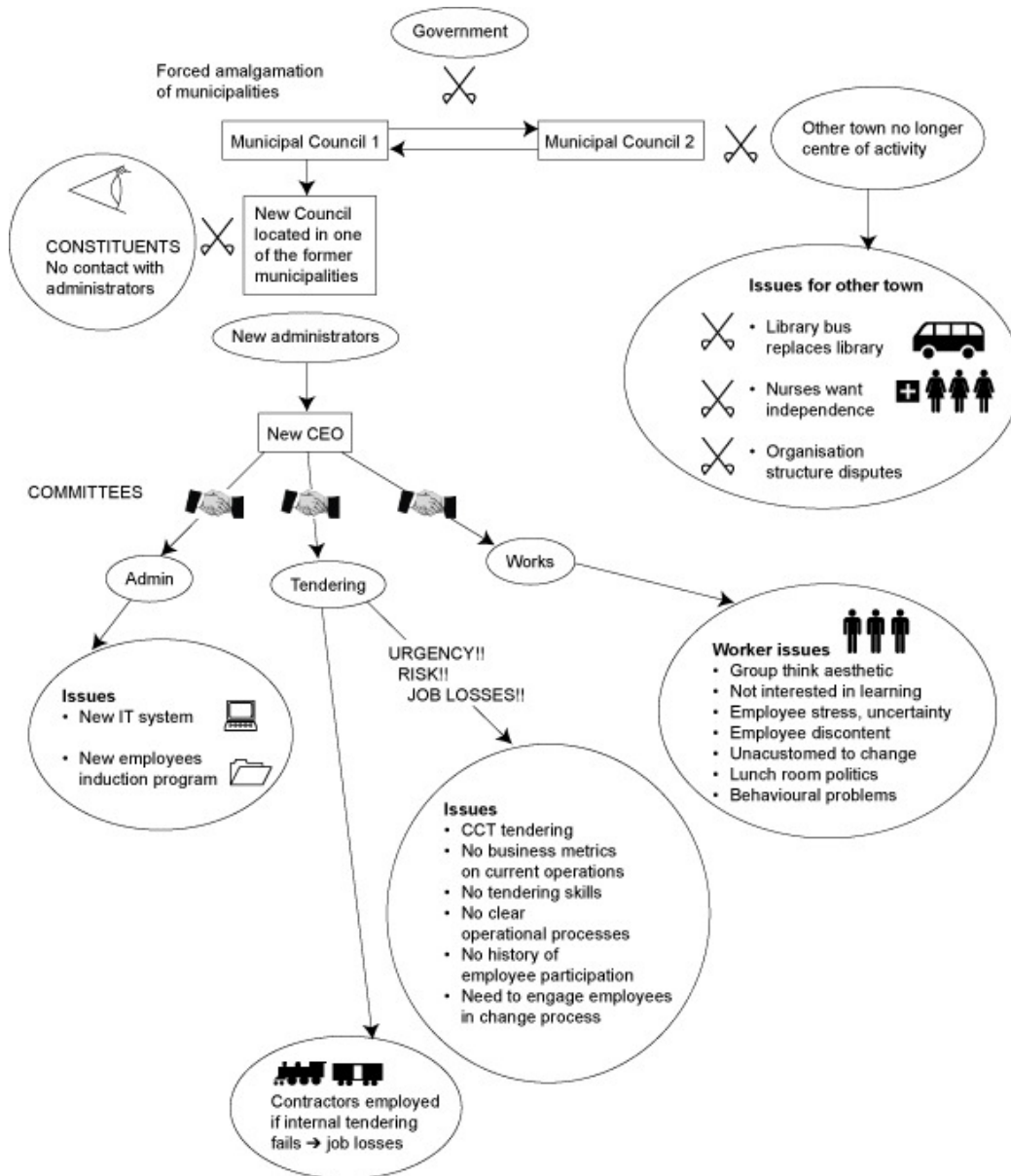


Figure 6.2 Rich Picture of The Problem Situation – Expressed Amalgamated Local Government

6.2.4 Developing System Models

The CATWOE components

The most important of these elements is the Transformation, followed by the Worldview, as these need to be determined before the other elements can be assigned identities. In fact, these two elements need to be complementary to ensure a correct understanding of the problem situation. It is useful at this point to reiterate the goals of both the study and of the organisation's change process.

- The goal of this case study is to: *Identify insights and ways of expediting the change process.* This part of the study considers the social change and the various resistive elements that inhibit progress.
- The goal of the organisation's change process, in addition to the overarching change of amalgamation and consolidation of multiple municipalities, is to: *Make them more efficient and cost effective by creating larger economic bases of operation and to make their operations commercially competitive.* This portion considers the coercive nature of the change process and its effect on the participants.

Transformation T

The transformation required by the council was one from a somewhat self-serving bureaucracy to a commercially structured organization with financial and resource probity that was service oriented and community driven. This was to be achieved by introducing competitive tendering for works and most services, and the establishment of an efficient corporate structure to support the businesslike administration of the organization. This necessarily entailed a change in the organisation's culture. The measure of success was a significant reduction in operating cost, the elimination of duplication of services and the more efficient use of resources including human resources. The reduction of the number employed was not mandated, however, if tendering for services was unsuccessful, the inevitable result was a lower employment level. Consequently, the Transformation (T) could be expressed as follows:

T Provide works and services that are cost and time competitive with those available from outside providers.

Worldview or Weltanschauung W

The participants in this human activity system view the world from different viewpoints, based on their background, culture, experiences and the relative importance of things to them. In this system, there are the views of the management, the staff, the community, the councillors, the administrators and the state government.

In selecting the most relevant viewpoint, it can be accepted that the administrators represent the views of the state government, and that the chief executive officer (CEO), appointed by the administrators, will in turn also represent the views of the state government. In this case, the most relevant viewpoint is considered to be that of the chief executive officer as it is fundamental to the meaning and the success of the system.

W Development of business skills and culture can make the transition feasible.

The Environment E

The environment in which the transformation takes place is the existing comfortable rural municipal office environment with a number of serious overlays. The first is the political environment of coercive amalgamation of municipalities. The second is the presence of a new driven CEO with a business rather than local government background. The third is the urgency for change, which in this case is the preparedness and ability to win competitive tenders for municipal works and services. There is also the surrounding community that has raised expectations that the changes will provide a marked improvement in value for rate money.

The political environment is considered the most relevant here, as it was announced as a rigid policy that would result in significant saving of up to \$100 million, and improvement in efficiency achieved through rationalisation.

E The political environment which initiated the change.

The Customers C

Although the higher-level state government can be seen to be a ‘political’ customer of the transformation process, and there are ordinarily a number of internal customers at various service levels, the overall beneficiaries of the transformation process are the members of the community that it serves.

C The customers are the community members served by the municipality.

The Actors A

As all the people directly concerned with the transformation are either direct or indirect employees of the municipality, the employees are the actors. This description will also include the CEO as an employee.

A The employees are the actors.

The Owners O

The owners are those people to whom the system is answerable. In this case the system is answerable to the ratepayers who are represented by their elected representatives, namely the councillors. As the case in point has both councillors representing the ratepayers and administrators representing the state government, the owners are considered to be this group of management people.

O The elected or appointed directors of the municipality.

A statement of the root definition is given in Table 6.2.

Table 6.2 Statement of Root Definition – Case No. 1

Statement of Root Definition
An organisational change, initiated by the state government, and put into practice by their appointed representatives, to change the structure, culture and practices of the municipal authority, for the cost and service benefit of the community, in an environment of forced amalgamation of municipal districts.

6.2.5 Development of Conceptual Models

Conceptual models are used to illustrate the relationships between the elements defined in the root definitions. It is an account of the activities which the system must do in order to represent the system as it is defined in the root definition (Checkland 2000). Their construction follows an iterative cycle as part of the process of analysis and they are primarily concerned with expressing the objective rather than the method of achieving the transformation. The structured arrangement of the ideal conceptual model is shown in Figure 6.3.

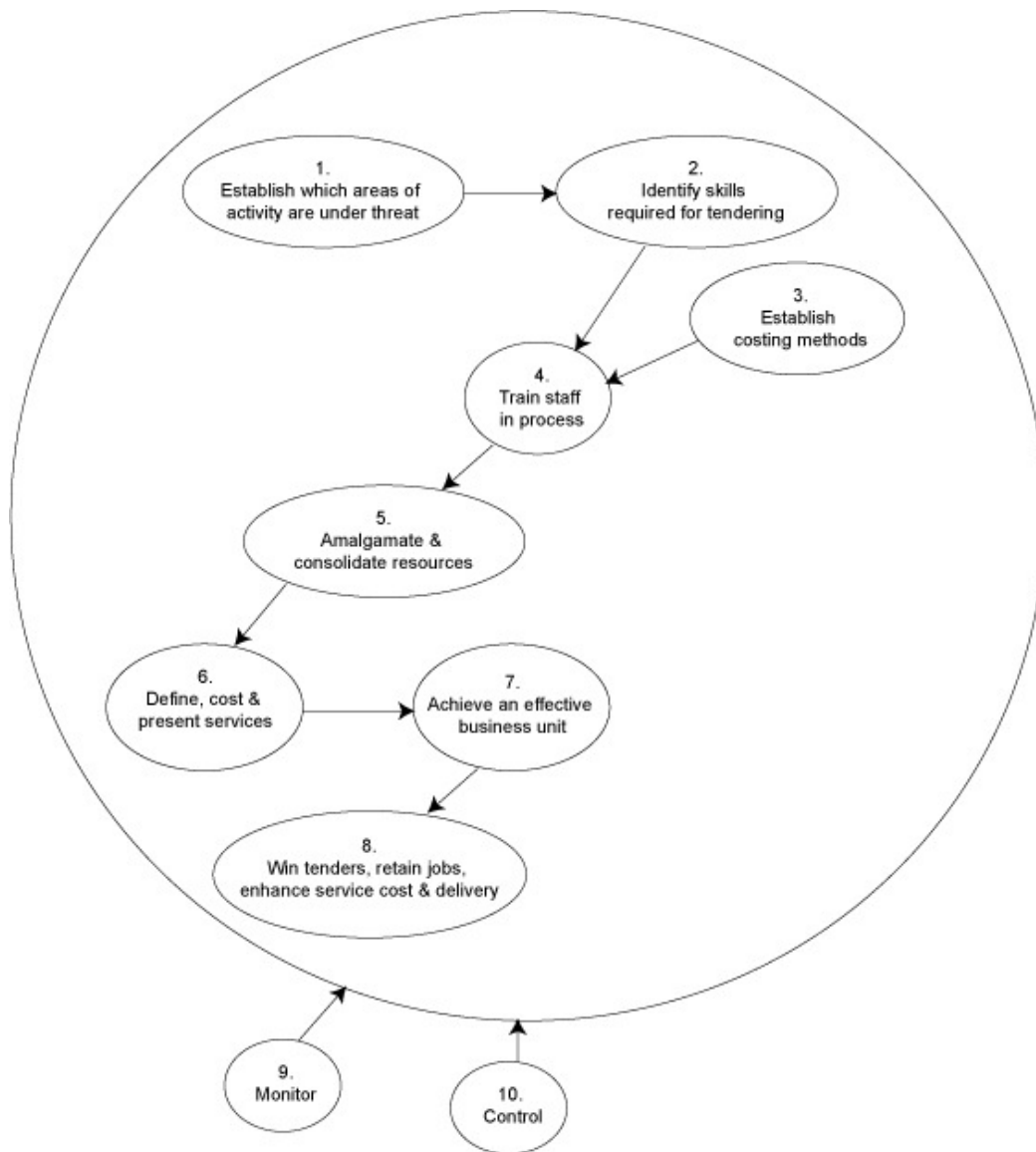


Figure 6.3 Conceptual Model of the Problem - Structured

The Conceptual Model

The conceptual model is compared to the real world situation as depicted in the rich picture. Each activity identified in the model is challenged with the question “Is this done at present and if so, how?” This is where the most significant learning occurs.

The results of the iterative process are summarised as follows:

There are significant differences between the rich picture and the conceptual model as competitive tendering was not required previously. Although the activities of the organization existed in general terms, they did not exist in a business format.

They are expressed in Table 6.3.

Table 6.3 Elements of the Conceptual Model – Case No. 1

Elements of the Conceptual Model
First establish which areas of activity were in fact under threat from competitors
Identify skills required for tendering
Establish costing metrics
Train staff in the process
Amalgamate and consolidate resources
Define, cost and present services
Achieve an effective business unit
Win tenders, keep jobs and enhance service cost and delivery
Monitor and control the process

Comparison of Conceptual Model with Real World

The conceptual model is compared to reality as depicted in the rich picture and from that comparison, changes are proposed to achieve the ideal outcomes as shown in Table 6.4.

Table 6.4 SSM Comparison Stage – Case No. 1

Conceptual activity	Reality	Proposed change activity
Establish which areas of their activity were in fact under threat from competitors	Uncertainty, resentment and fear of job losses. Large commercial competitors active and proficient	CEO identifies works and services under threat
Identify skills required for tendering	No in-house experience	Hire skilled managers. Map processes
Establish costing metrics	Loose system of cost-plus accounting	Introduce activity based costing and IT based cost management
Train staff in the process	Departments not responsible for cost accounting	Delegated responsibility for cost control to operating level. Expose staff to process
Amalgamate and consolidate resources	No team culture. Separate towns culture	Develop team work and team culture
Define, cost and present services	Imposed urgency in achieving tendering proficiency	Focus attention of entire staff on tendering process to retain jobs
Achieve an effective business unit	Management lacked business skills. Blue collar workers lacked incentive and initiative	Introduce management and leadership training. Involve blue collar workers in activities and communications
Win tenders, keep jobs and enhance service cost and delivery	Some services already lost to contractors	Strong leadership and support for positive outcomes
Monitor and control the process	New CEO responsible for positive outcomes	Costing metrics and controls in place

To achieve these desired changes, the following three areas of desirability and feasibility were addressed:

Attitudinal Change

As the overall policy change was a coercive change, there was considerable hostility to its introduction. However, as these changes were occurring in all areas of the state, the realisation that there was no turning back turned thinking to a more positive outlook. To retain jobs and to consolidate their future, participants had to adopt a ‘can do’ attitude. This was reinforced by the firm direction and support of the CEO. On the negative side, the new CEO found there was a latent inertia in thinking, and also a

tendency to think as a group, particularly with blue-collar workers. This reduced the level of spontaneity and initiative in generating new ideas and slowed down the renewal process. There was also a reluctance to accept and follow the new staff induction program. Employees were now held more accountable for the stewardship of their time and resources and were expected to take a more holistic attitude to the overall operation of the organization.

Areas of conflict included the nurses' team. This group of employees have a strong sense of moral equity and professionalism. They had difficulty taking direction from the CEO and relinquishing direct response to community calls. The new IT system proved to be an area of conflict as many employees were reluctant to learn how to use it, or apply it to their work processes. This also slowed the renewal process. Other areas of notable conflict were with the community, in areas such as the change from a regional library to a library bus and the loss of the town hall to another location.

Structural Change

A major structural change was required in amalgamating multiple municipalities into one new authority with a new CEO. Material and human resources had to be rationalised. This meant that the new municipal centre was relocated to a central location, in this case, one of the existing town halls. This then affected other locations where their former town hall was redundant and was no longer the focal point of that district causing community discontent.

Internal structural changes were also required. A new business unit was established to handle the commercial operations. Workshop groups were transformed into work teams that were used to encourage interchange of ideas and a sense of interdependency, so continuing the theme of the SSM iterative process. The CEO became the only link between the elected representatives and the work force.

Procedural Changes

As the main change driver was the need to succeed at competitive tendering, mapping and refining of all associated processes was required. Staff were also exposed to quality tools and Total Quality Management (TQM). Process improvement teams were established to improve efficiency and outcomes. Teamwork was encouraged in all areas to stimulate involvement and initiative. Regular work team briefings

enhanced communication and consolidated involvement. The introduction of a new IT system and its use in managing the information necessary for competitive tendering required training and learning. Management and leadership training was introduced for senior staff and was accepted with enthusiasm.

Lessons Learnt

This case study illustrates a situation requiring a very large cultural change to a group of people who had experienced a very stable environment with little or no change. As the coercive changes and new management projected an authoritarian image, the response by the work force tended to produce groups of 'ins', those who could accommodate the change and 'outs', those who resisted change. The CEO countered this by the use of a dominant coalition of management and by displaying a strong message of support, with both words and actions.

The most significant lesson learnt from the SSM workshops was the need to resolve the conflict between the politically imposed urgency to succeed at competitive tendering and the lack of skills, information, and procedures for achieving success. Mapping the processes, setting achievement standards and training the staff bridged this gap. An associated problem was the need to have realistic costing information for the tender process. This was addressed by hiring new management staff with experience in process costing. The introduction of a new IT system brought with it not only the problems of delays in learning the software but in this case, using and relying on IT as part of the work function. This was addressed progressively with training and exposure to the system. Another problem was the considerable cultural divide between the existing bureaucratic culture and the required business culture of responsibility and achievement.

Points of Leverage

The urgency underlying the need to be successful at competitive tendering was an imposing change driver. Government policy required an immediate start on the tendering process. Processes had to be in place and skilled people hired to achieve results. Process competence was addressed in the SSM groups and was leveraged by process mapping, cost probity, teamwork and the employment of skilled managers. These ideas and the agreement on what was needed and how to implement it were

debated in the SSM workshops conducted with the employees. The consensus achieved through the learning experience of both the employees and the management enabled these changes to be made without delay or significant resistance. This was the area of high yield from learning in this case

Winning the hearts and minds of the employees was also part of this learning process. The SSM groups suggested giving genuine and unflagging management support for the employees, providing skill development and promoting a winning attitude. Tenders won meant jobs retained. Tenders lost meant redundancies. Successful tendering was by far the most significant lever of change. This was a significant point of change in thinking patterns.

Hidden Concerns Raised

Although government policy offered a sweetener of 20% rate reduction and the likelihood of a rate freeze for five years, communities soon became disenchanted when their library was closed, or they had to drive to another town to visit the municipal offices, or as some individuals found, they no longer had direct access to council services. To address these issues, the SSM workshop introduced the idea of a public relations program to inform the community of the new status of the municipality, its service delivery and its relation with the community.

It became evident from the discussions that employees needed clarity of direction and some sense of stability in times of change. Some technology was changed and some of the roles of the municipality were changed. Retaining the premises and staff was suggested as a means of achieving much of this stability. In the other towns where the work premises were relocated to another town, employees felt much more disrupted and offered more resistance to change. This proved to be a set back where no positive ideas were forthcoming.

6.3 Case study No. 2: Award Restructuring

6.3.1 Background and Problem Situation- Unstructured

As foreign competition for goods with a high labour content increased in recent years, the government, unions and employers looked at ways of making Australia's manufacturing industries more competitive and a more secure source of employment. At the same time, governments were attempting to make local industries more internationally competitive and economically efficient by reducing protection provided by tariffs and quotas and by promoting increased productivity. The culture that commonly existed in Australian workplaces presented a major handicap for international competitiveness of industry. Typically, it resulted in work that fell short of international standards of quality and productivity. It presented a complex problem of a mixture of social values and social structure and was directly linked to the technical education and training system. It could be seen as one of the major constraints to Australia's competitiveness.

Various financial, policy and structural initiatives were introduced with the aim of updating and reforming Australian industry to make it world competitive. Part of the process of renewal was the need to address the award system of wage fixing and the division of labour. This issue was highlighted as a result of the union mission to northern Europe where comparisons were made with progressive industrial structures and labour relations in target countries. The industrial parties, ie the unions, the government and the employers, realised that the need for internal structural efficiency and the pressure of overseas competition meant that Australian industry had to change their work practices and modify their traditional work culture.

A major change in industrial structure at this time was the move away from the traditional and long held practice of centralised wage fixing to the more flexible enterprise bargaining system and the principle of structural efficiency. This was a period of cooperation between unions and government when an accord was struck which tied wage rises to increases in efficiency and productivity. This in turn meant a restructuring of both industries and their associated enterprises to be able to adopt new practices of industrial relations management and determination of wages and conditions.

The institutional and regulatory framework, which governs industrial relations and the associated human resource management in Australia, is the *Workplace Relations Act 1996* and the subsequent amendment, the *Workplace Relations Amendment (Work Choices) Act 2005*. This act has been further amended recently by the present government and is now known as the *Fair Work Act*. Although these are federal laws, they do not represent a uniform federal system, as the states also have workplace laws, which have undergone change and add to the complexity of the situation. These legislative changes in the nature of work and labour markets, combined with an overall move from collective processes to individual or enterprise processes, result in the traditional benchmark of the award being diminished. However, this benchmark was a strong factor in the formation of workplace culture, which existed up to the present time.

The federal Department of Employment and Workplace Relations define awards in the following way:

“Awards are legally enforceable orders or combinations of orders issued from time to time by federal or state tribunals that set out the minimum wages and conditions of employees covered by them. Awards may be made by consent or by compulsory arbitration, or a combination of both”.

The awards define the fair minimum wages and conditions and act as a safety net for employees. The legislation concerning industrial relations is politically sensitive and is continually changing. The issue of cultural change in the workplace as a result of changes resulting from award restructuring and modernisation is the subject of this case study.

The new initiatives proposed by the industrial parties sought more flexibility in work and employment practices that would enable the attainment of more efficient deployment of labour and reduced labour costs. In fact the whole structure of employment was moving towards a performance relationship with either individuals or entire enterprises.

A review of the existing work practices, as laid down in the award, revealed significant constraints for employers. Skill demarcations, working hours and pay structures linked to classification level and period of service were examples of some of the elements that created cost without corresponding output or increase in

productivity. A case in point is the Metal Trades Award which is found in most manufacturing industries. The metals industry was chosen by the industrial parties as a pilot for the introduction of award restructuring. The award provides classification of employees and a skill based career path. The existing, or original award, which was set up in 1907, in times of limited education and skill formation, contained forty-eight separate classification stages from induction to professional level. Progress through the stages was based primarily on time spent at each level with little regard to competency. The modernised award reduced this to fourteen stages with progress based on competency and training. It also provided for multi-skilling, designed to overcome rigidities in labour usage where individual tasks were required to be carried out by different skill specialists. With multi-skilling the one metal trades employee could do minor electrical or carpentry work without causing an award classification conflict and associated industrial dispute. In effect, the awards were simplified and suited to the efficient performance of work according to the needs of a particular workplace or enterprise. The concept of award restructuring called for the introduction of a common base starting rate across all industries, a reduction of classifications to around six or eight levels, and progress based on skill, training and competency. The intended outcome of these changes was to create a more skilled and flexible and ultimately more valuable workforce.

Although the restructured awards made economic sense, their introduction caused a cultural upheaval in industry. Industrial culture had formed, based on around forty years of the former structure. It has also taken on a confrontational attitude between employers and employees. Industrial cooperation and consensus was foreign to this culture. The task of introducing these micro-economic reforms was compounded by other changes to human resource practices at this time.

The role of women and the revaluation of their contribution to the workforce were occurring along with their fight for equal pay. The large number of small unions was being amalgamated into larger more comprehensive unions covering a range of skills. Moreover, the role of unions was diminishing as the number of direct employer-employee relations grew. Part-time and casual work was increasing as was outsourcing of non-core activities and as industries restructured, redundancies occurred.

Award restructuring changes, along with other industry, social and human resource management changes presented a complex messy situation to employees. To introduce these changes and to win the hearts and minds of the employees, soft system management was applied to this situation.

The diagram in Figure 6.4 is a rich picture of the problem situation. To gather information for this case study, interviews were conducted in two industries that were most directly affected by both the economic conditions and the legislative and cultural changes. These were the metal trades industries (MTI) and the textile, clothing and footwear industry (TCF). The metal trades had the most number of changes to classifications with the resultant deep cultural changes. The TCF industry had the highest labour content per item of production for a manufacturing industry. Their employees were predominantly female with a high proportion of immigrants with limited English skills. Here the outlook was loss of jobs to low labour cost countries. This portion of industry was included to examine the most adverse aspects of job losses due to changes in economic protection and award restructuring. The metal trades industry was researched to examine the affects of award restructuring on the culture of the workplace.

Although the study initially intended to address both the Metal trades and the TCF industries, initial investigation revealed that setting up workshops with female workers in the TCF industry was culturally restricted as many of the women had cultural barriers to working with men in this type of environment. The study proceeded with soft systems methodology in the metal trades industry. (Data gathered in the TCF industry was used in a further study at a later date).

As the industry accessed for this study had approximately 2000 employees, focus groups were set up for participation in the SSM process. Participants in the groups were selected, taking advice from supervisors and union representatives, to achieve a representative sample of the workforce.

The following Figure 6.4 illustrates the problem situation of award restructuring.

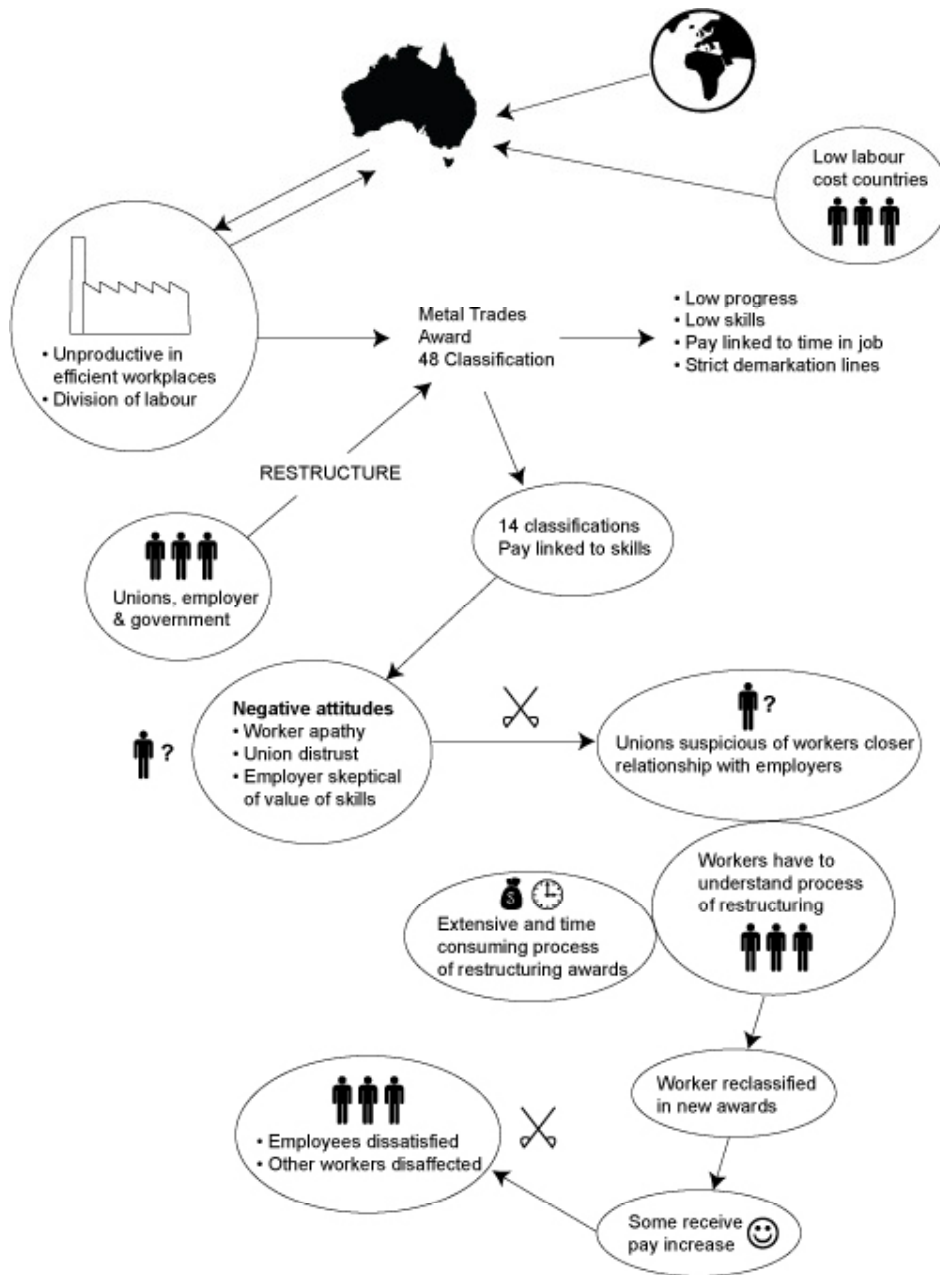


Figure 6.4 Rich Picture of the Problem Situation - Expressed

Award Restructuring

6.3.2 The CATWOE Components

Transformation T

The transformation required is embodied in the term 'Best Practice' which meant benchmarking work practices against world's best standard. The major constraint to this practice addressed here is the structural constraint of the award system. To overcome this restriction, an attitudinal change, embodied in a cultural change towards a more flexible and efficient workforce, driven by worker involvement, supported by increased skill and education is required. New initiatives by management, new technology and investment, more cooperative strategic alliances with suppliers could not succeed without a corresponding change in workplace culture.

T Change the workplace culture from a mechanistic culture to a productive oriented culture.

Worldview or Weltenshauung W

There are several significant worldviews to consider in this case. The views of the employers, the employees, the government and the unions are all pertinent. Of these, the government's interest is in a viable economic manufacturing sector providing jobs, exports or import replacements and wealth creation. The manufacturers' interest is in survival against competition, predominantly foreign competition, as investment and technology alone will not achieve success without a positive cultural change. Their own studies indicate that the competitive advantage of foreign competitors lies in the prudent involvement of a skilled workforce (Wilshire 1990). The worldview of the manufacturers is considered to be the most relevant view in achieving the necessary transformation.

W Attain workplace cultural change as a means to achieving and sustaining viability and competitiveness in a world market.

The Environment E

The environment for change in industrial workplaces was one of competing values. Manufacturing success up to this time had relied heavily on mass production with trends toward unified product and long production runs providing economies of scale. Labour had been divided such that jobs were defined narrowly into small elements requiring limited skills that were easy to learn. Flexibility was achieved by interchangeability of workers and by hiring and firing to suit demand. The result was that management saw workers as a cost rather than an asset to be developed. Large workplaces with employee number in excess of 1000 were generally heavily unionised. As machines became smarter and jobs became mechanised, workers looked to their union to fight for their retention and survival. The unions themselves were fragmented by skills or trades whereby a workforce of 1000 may be represented by up to twenty different unions.

The skill training and development regime was time based. Tradesmen 'served their time' as apprentices. Although many highly skilled workers were produced by this system, competency was not a key driver and time served was a basis for advancement. Trades skill training also involved a range of related skills in other areas, for example, all electricians were taught basic welding, however, the awards structure, supported by the relevant union, prohibited the use of these ancillary skill in that trade area. Opportunity for flexibility of work was curtailed.

Additional variables such as the move for affirmative and egalitarian action by woman, the move to amalgamate unions or to establish enterprise unions, the call for industrial democracy with more sharing of information and worker representation at boards level, and the move to out-source non-core activities were all active at this time. All parties were involved in both a progressive and coercive change, and all wanted to be winners. The resultant environment is one of uncertainty particularly for workers with limited skills and strong traditional values, and faced with the threat of new technology and mixed messages from unions and employers about the future, giving way to distrust in the direction of change.

E The environment is one of an ingrained culture of distrust of management, uncertainty of change and a rigid structure of work classification and demarcation.

The Customers C

The customers of this transformation can be seen as a wide ranging group of interested parties. The government, representing the nation, will benefit from an efficient and viable manufacturing sector of the economy. The employers and their owner/investors will benefit from a profitable and flexible enterprise that is not being phased out of viability. The employees will benefit from a wider range of transferable skills, more interesting and variable work, more job security and more saleable skills and experience. The unions benefited by amalgamation of smaller unions into larger enterprise unions as declining membership and loss of bargaining power concerned them. They also benefited from the improved value of workers through education and training and skill enhancement, giving the union more bargaining power. The most direct benefit is considered to accrue to the owner/investors, as it is a watershed in their business strategy. The workplace cultural change will also necessarily involve a cultural change in management skill, style and attitude.

C The owners/investors are the customers.

The Actors A

The people concerned with the transformation are primarily the employees of the organization including the management. Other related parties are the employer and worker representatives, namely the employer associations and the unions. The education and training providers are also participants. Although the employees are not the drivers of change, they are the principal participants in whom the change process rests.

A The employees are the actors.

The Owners O

The owners are those people to whom the system is answerable. The people driving change are the industrial parties, ie the government, the employers and the unions. As the education system is a provider of skill training, they could also be recognised as having ownership interest. The principal owners are considered to be the industrial parties

O The owners are the Industrial Parties.

A statement of the root definition is given in Table 6.5.

Table 6.5 Statement of Root Definition – Case No. 2

Statement of Root Definition
A workplace cultural change, initiated by the industrial parties, to support the restructuring of Australian manufacturing industries, to become world competitive, in an environment of high levels of uncertainty.

6.3.3 Development of the Conceptual Model

The following Figure 6.5 illustrates the conceptual model of award restructuring

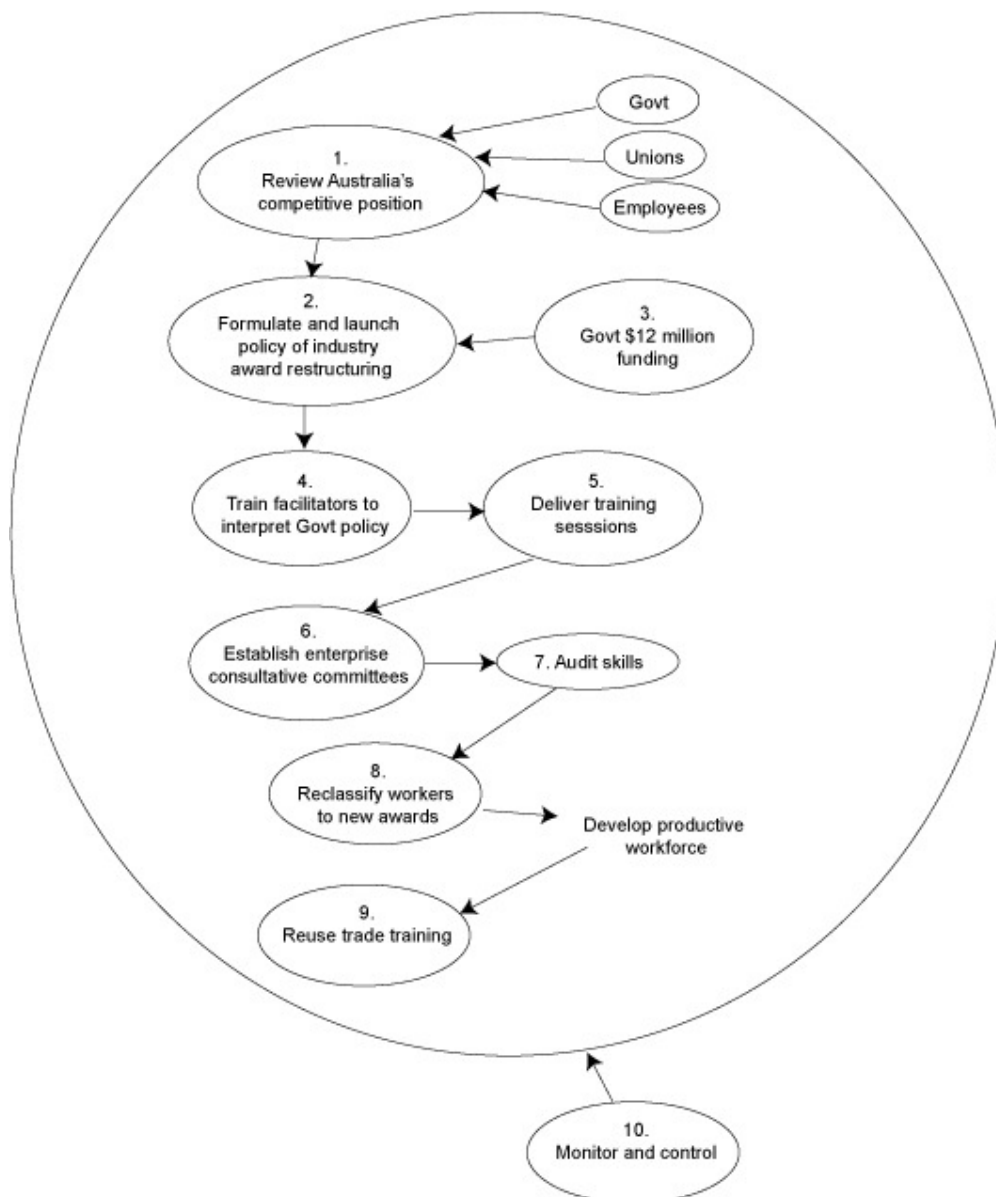


Figure 6.5 Conceptual Model of Award Restructuring - Structured

The Conceptual Model

The conceptual model, as developed, identifies recognition on the part of the government, the employers and the unions that Australian industry had fallen behind its international competitors in terms of productivity, quality and skill formation. The resultant policy formation on restructuring industry included a major component of award restructuring. The outcomes of the iterative process are expressed in Table 6.6.

Table 6.6 Elements of the Conceptual Model – Case No. 2

Elements of the Conceptual Model
Review Australia's competitive position with government, employers and unions
Formulate and launch policy of industry award restructuring
Fund policy delivery to industry with government contributes of \$12 million
Train facilitators to interpret policy to industry
Deliver industry training sessions
Establish enterprise consultative committees
Audit skills and reclassify workers to new awards
Develop productive and flexible workforce
Revise trade skills and trade training to reflect new competencies required
Monitor and control the process

Comparison of Conceptual Model with Real World

Having determined an appropriate conceptual model, the next stage of the process is exploring the real situation as illustrated in the rich picture, agreeing on the changes proposed and implementing them.

The process of award restructuring is aimed at:

- Simplifying and updating the award structure
- The removal of obsolete classifications
- A reduction in the number of classifications
- The broad-banding of a range of jobs under single classification
- Defined career paths for all workers under the award
- Links between training, classification and wages

Its implementation follows these general stages:

- Review of the structure of the award itself
- Definition of the classifications
- Identification of skills used in performing tasks within classifications
- Review of relationship between classifications
- Identify training needs of industry and employees

The conceptual model is compared to reality as depicted in the rich picture and from that comparison, changes are proposed to achieve ideal outcomes as shown in Table 6.7.

Table 6.7 SSM Comparison Stage – Case No. 2

Conceptual activity	Reality	Proposed change activity
Review Australia's competitive position with government, employers and unions	Australia now exposed to global competition with tariffs and quotas reduced	Establish broad productivity targets and industry benchmarks
Formulate and launch policy of industry award restructuring	Awards based on 1907 structure favour division of labour	Redesign award structure to simpler flexible structure with multiskilling
Fund policy delivery to industry with government contribution of \$12 mil.	No industry support considered. Benefits not obvious to employers	Contribution required from government, employers and unions
Train facilitators to interpret policy to industry	Concept is complex and not fully understood	Set up resource centres in each state
Deliver industry training sessions	Present award system deeply ingrained and back by law	Plan industry training program
Establish enterprise consultative committees	Workers not involved in industry reforms	Encourage participation in enterprise committees
Audit skills and reclassify workers to new awards	Skill levels related to time based awards, not competencies	Identify new skill benchmarks
Revise trade skills and trade training to reflect new competencies required	Poor skill levels highlight resentment to change	New trade training courses based on competency.
Develop productive and flexible workforce	Productivity poor compared to rest-of-world	Determine productivity benchmarks. Retrain to raise skill levels
Monitor and control the process	No system exists for monitoring or controlling	Industry restructure in place

To achieve these desired changes, the following three areas of desirability and feasibility were addressed:

Attitudinal Change

The entrenched culture of the existing award structure had contributed to a confrontational attitude between employees and management. In some cases this was encouraged by the union to engender solidarity in their cause of workers' benefits. In many cases workers tended to ignore or distrust messages emanating from management. This presented an immediate obstacle to reception of change if the message came from the employer. To overcome this barrier, the government sponsored consulting teams comprised of industry and union people to introduce the changes to industry. It was important for acceptance of the message by the workers to hear of change from the unions as well as from the employers. However, at an introductory information session for employees at a government ordinance factory, workers finished work thirty minutes early and assembled in a meeting room to hear the presentation about award changes that would soon affect their lifestyle at work. The presenters fielded a number of questions and were half way through their message when thirty minutes had passed, and eighty per cent of the audience stood up and left for home, as it was then their normal quitting time. To resolve this problem, the task of communicating the message of award restructuring was handed to the enterprise consultative committee. This body consisted mostly of workers with one representative of unions and management and proved to be a more acceptable vehicle for communications on this issue. Some members of consultative committees became participants in the SSM focus groups, so providing an interchange of information.

Interviews with workers identified the problem that many process workers and older workers did not want change and rejected it, whereas younger workers welcomed the flexibility and opportunity for rapid advancement promised by the new awards. The reluctant workers were assured that they could continue with the status quo, or could interchange between other jobs to provide variety of employment.

The introduction of CNC machinery brought a new class of programming and tool setting skills to manufacturing. One young operator was questioned on his ability to set up his machine. He replied that he was fully trained but was not permitted to use his set up skills as an 'operator'. This was indicative of the structural and attitudinal barriers to increased productivity.

Attitudinal change on the part of management also proved difficult. This mainly centred on the provision of information to the consultative committee. Consultative committees were introduced as an element of participative practices under the new award scheme. They are intended to be representative of the entire workforce, whether they are administrative, clerical, process or skilled. An SSM group set up with management indicated that management's concern was loss of authority and control, whereas union concern was workers achieving a closer relationship with management at the expense of union influence. Management also expressed concern at the accompanying theme of industrial democracy, which was promoted by both government and unions, as management saw this as a form of social engineering.

Other concerns expressed by workers in their SSM focus groups were their limited range of skills and their inability to transfer to other work. This was more prevalent among migrant workers with limited English and no formal skills training, and with female process workers. The consultative committee took up these concerns.

Workers showed serious concern at any attempt to directly measure productivity, however, discussions in a non-threatening SSM group enabled their concerns to be raised and considered so that agreement was reached on how the data was used and how it would affect the employees. Once it was clear that measures were non-threatening, they accepted them.

Unions and their representatives also found difficulty in adjusting their ingrained attitudes to the more cooperative approaches called for by the restructuring program. Union representatives found themselves in power struggles for positions of authority as smaller unions became amalgamated.

Structural Change

Structural changes were the centre point of award restructuring. The structural changes related to the redefining of classifications and the banding of existing levels to simplify the structure. Additional elements were the recognition of work experience and the concept of pay progression linked to higher levels of skill through access to training and a defined career path. Restructuring also offered the

opportunity to re-design jobs and to integrate tasks that had been separated by award demarcations or union membership by trade category.

SSM groups of workers expressed concern at the determination of entry points in the new classification level, where some were skill based at the expense of experience. Some workers reported that the promise of improvements rang hollow as the requirements for increased skill level was minimal or non-existent in some jobs. This was particularly true of process or assembly line workers, many of whom were female. This sector of the workforce represented a large proportion of the most stable and experienced employees. They reported feelings of alienation and disenfranchisement by the new system based on merit and accreditation.

Middle managers identified a threat to their role as workers' skill levels increased along with their involvement in decision-making. This threat proved to be very real as a reduction in middle level bureaucracy was an improvement sought by the restructuring process.

Structural change was also directed at the educational and training system supporting trade skills. Here the approach was to break the skills into basic elements and to match those elements with matching skill-training modules. Workers replied that training should be provided as in-house training as some workers, and in particular migrant female workers, had very limited access to after-hours or public training due to their roles as the primary carer in families or to cultural restrictions on travel.

Structural changes also envisioned movement between different areas of an industry to encourage multi-skilling. Lower skilled workers reported a lack of interest in this opportunity.

Procedural Change

The process of procedural change started with skills analysis and skills audits. From there classifications were determined and workers were allocated to new categories. As each category carried a pay scale, there was extended discussion and debate on the level of pay scale, particularly as some workers received an increase and others remained at the same level. The process of skills auditing proved to be extremely

time consuming and at times, lacked the commitment from both employers and unions. In cases where change occurred more rapidly, workers reported higher levels of stress and anxiety. Many workers indicated resentment at the requirement to undertake training to upgrade or broaden their skills. Managers expressed concern at workers being reclassified at higher levels when they were doing what appears to be the same work. These concerns highlighted the need for job redesign and the introduction of activity based costing to cost accounting techniques and to existing practices of flat rating of labour or standard costing.

The new technology such as robotics required a mixture of mechanical and electrical skills. Existing demarcation lines did not cater for this type of skill level. This demanded new levels of flexibility where the job had to be done by one person.

Lessons Learnt

The case of award restructuring was part of a wider restructuring and updating of industry practice to achieve international competitiveness. Its purpose was to remove structural barriers to productivity improvement and to animate and tap the knowledge and experience of the workforce.

It did achieve its purpose, however, the take-up and transition was very slow and time consuming. Although driven by the employers and unions, their own officials proved slow at either understanding the benefits and ramifications of the change, or showed a lack of enthusiasm in pursuing its introduction. There was significant inertia in the restructuring process. Most low skilled process-type workers were disinterested and older low skilled workers with ingrained traditional culture openly rejected its introduction. The assumption that all would directly benefit from the changes was flawed. Also the assumptions that the metals industry model for change, which was the most complex and comprehensive, could be applied to other industries was rejected by the industrial parties of the other industries on the basis of broad differences in skill levels or limited skill use.

The assumptions of the manufacturers were also questioned. The need for the division of labour into simple tasks was passing and the workforce had the potential

for higher skills and the contribution of ideas and initiatives. New machine tool technology eliminated many simple tasks, (along with associated errors and rejects), but required new skills in programming and monitoring.

The learning generated in the SSM groups was limited where low skilled or process workers were participants. These individuals were not used to voicing opinions or perceptions about the process in their workplace and made limited contributions. The identification of high yield learning was disappointing in this case, whereas higher skilled and better-educated workers did discuss the concepts readily and were able to adapt to the changes quickly.

Another setback in this case was the multiple sub-cultures of management, unions, skilled and process workers. During the period of the study, it proved difficult to establish sufficient trust between these individual groups to achieve true accommodation of different worldviews. Where groups were set up of similar cultural types, vigorous discussion took place, however it lacked the presence of truly pluralist views and very little creative thinking resulted.

Points of Leverage

Although there was pressure from the industrial parties for change, there was a noticeable absence of urgency of implementation. The major driver at the time was related to wage fixing and a four per cent wage rise was fixed to the implementation of award restructuring. Implementation, however, was out of the hands of the employees. Employers were reluctant to move without a defined benefit in productivity. The most significant leverage in the metal industry was the redesign of jobs to accommodate and fully use the skills of their work force. The new grades were introduced in a way that recognised both skill and experience. Pay could go up as employees learnt new skills. The high yield experiential learning was obtained by discussions with skilled workers, backed up by union experiences from the European study, about the relativity of skill levels and pay levels. The employers and the skilled workers were then able to discuss the identification of levels of deployment of these skills in the new award structure. This part of the process had been accelerated.

The Award Restructuring steering committee also learnt that as the metals industry model was the most complex industry to change, separate models for each major industry group would expedite the process in the respective industries.

Hidden Concerns Raised

Although restructuring of the awards may be successful, it may not lead to increased productivity and competitiveness unless there are corresponding changes in labour efficiency, job redesign and quality improvement.

Unions may consider they have more to gain in terms of power and influence by focusing on traditional campaigns for pay equity than for award restructuring.

Unions are also concerned about their diminishing role as workers deal more directly with management. This is intensified by the continuing decline in union membership.

The role of women in the change process was highlighted as having insufficient consideration, particularly with the use of the metals industry as a general model. Women were poorly represented in that industry, and in many other industries, where they represented up to eighty per cent of the workforce; their role was predominantly process or repetitive work. The opportunity for advancement based on skill improvement or additional training was minimal. They also included a large number of part-time workers with limited access to training.

6.4 Case Study No. 3: A Machinery Dealer

6.4.1 Background and Problem Situation – Unstructured

The dealers of a large world wide earthmoving machinery manufacturer are independent companies, usually family owned business, who are appointed by the manufacturer and operate under the terms of a mutual agreement known as a Dealer Agreement. They are not franchisees or agents of the manufacturer. Their appointment is based on their knowledge and affinity for the industry, their business skills and resources and their commitment to the business. They usually do not sell or represent any other manufacturer's products. There is no fee for their appointment and either party may terminate the agreement within a mutually agreed time frame. They have an extremely high record of success and of wealth creation. Their products are usually the price leaders in their class.

Dealer businesses are exposed to the same business risk as the national economy and in particular, to the rise and fall of the earthmoving and construction industry. The manufacturer constantly monitors the dealer's performance against a range of benchmarks and if a dealer business falters, the manufacturer provides consulting services to identify and resolve the problems. The worst-case scenario is the termination of the dealer agreement.

This case study concerns a review of a particular dealer's general poor performance. Measured against the manufacturer's benchmarks, inventory turnover was low, lost sales high, cost of sales high, parts service performance low, warranty cost high and mechanical service inefficient. A major turnaround was required to retain the dealership agreement. On the positive side, the dealer was a third generation family business that had been a dealer for fifty years and had a track record of past success. However, the performance of the dealer had declined with each generational change. Past management had been autocratic with the result that other employees had adopted a subservient attitude. The passing of the founder with his drive and vision had left a leadership vacuum. The current generation had become very conservative and risk averse in terms of investment. The culture of the organization had moved away from the entrepreneurial style of the founder to a conservative holding style.

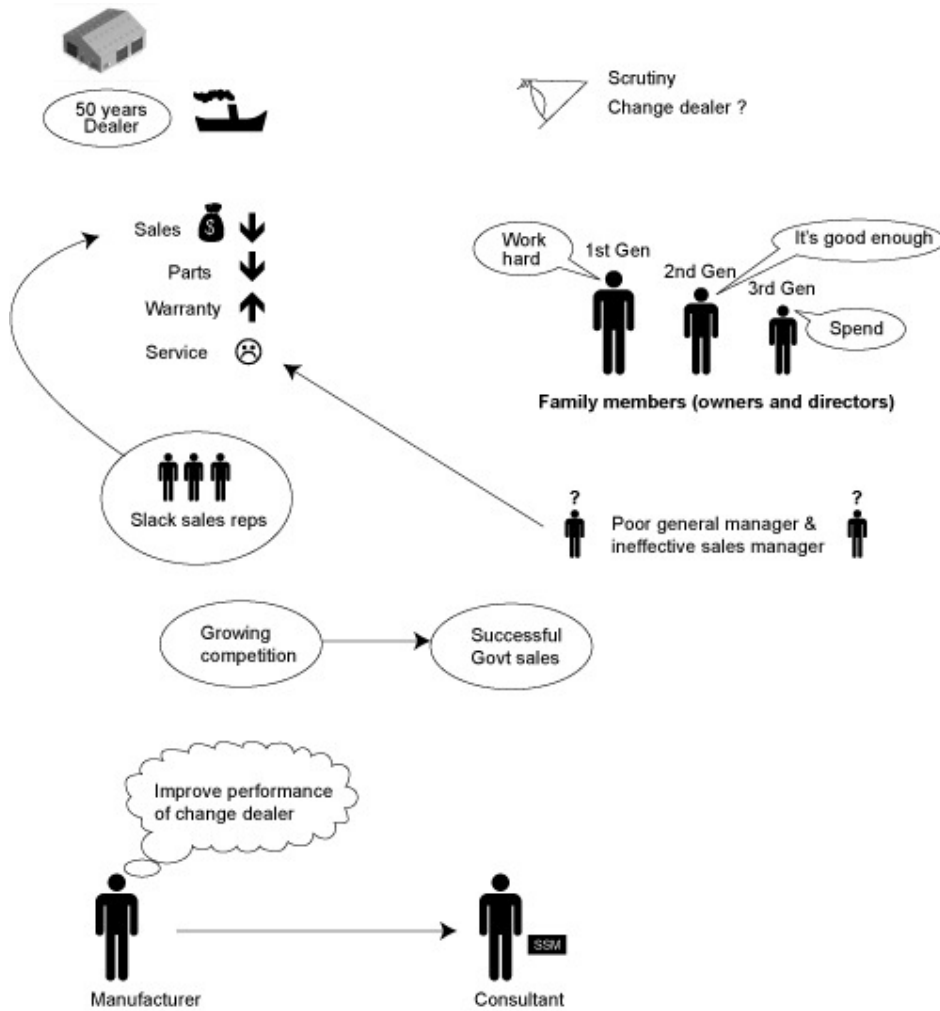
At the time of the study, some family members occupied middle management jobs, whilst being on the board of directors at the same time. This created a conflict of interest in decision making and confidentiality. Shares were only held by family members although as a result of multiple marriages, not all members owned the same proportion of shares. Some junior members inherited shares from deceased members and so held a disproportionate level of power. The most senior family member was the chairman of the board by way of his share holding rather than competency. (He was the son of the founder). He was also the Dealer Principal although he did not take an active part in the day-to-day management of the company. A non-family general manager had been appointed to this position. This was contrary to the philosophy of the manufacturer; however, it was accepted, as the chairman had limited business skills. Also a new sales manager had been appointed recently.

The board were not proactive about the poor performance of the company and tended to reflect on past successes. Competition was relatively weak but had considerable success with sales to government, whereas, this dealer had virtually no government sales indicating a loss of business confidence in that market.

The loss of general business direction and poor performance together with the complex ownership and management structure presented a messy problem of business structure and operations management. Invaluable guidance was available from the manufacturer in the form of performance benchmarks from the network of independent dealers around the world. Opportunity also existed for dealer family members to take experiential work with other independent dealers or to visit sites where new initiatives had proved successful. Persuading the management to consider and adopt the advice and guidance offered remained a challenge.

Soft systems methodology was applied to identify solutions to the management structure and the operational problems. A working group consisting of third generation family representatives, senior managers and the manufacturer's consultant was set up to examine the problem situation using the SSM process.

A rich picture of the problem situation is presented in the following Figure 6.6
 The rich picture was established from interviews and observations with the directors,
 the management and the employees. Interviews were also conducted with the
 customers.



**Figure 6.6 Rich Picture of the Problem Situation - Expressed
 A Machinery Dealer in Trouble**

6.4.2 The CATWOE Components

Transformation T

The transformation required in this case was two fold. On the one hand, a more direct connection between the owners and the general management was required, and on the other hand, a more effective and successful business model was required.

Management needs to envision the levels of performance that could be achieved and establish a business strategy and structure to achieve them. This required leadership and business acumen at general management level that was not there at present. It also meant a change in the organisation's culture.

T Bring the organisation's performance up to the worldwide standard of other dealers.

Worldview or Weltenshauung W

The relevant viewpoint for this situation is considered to be that of the manufacturer, as they are the providers of the goods. However, they do not adopt a coercive approach. Rather they work towards a mutual viewpoint and use persuasion to convince the dealer to adopt their philosophies and strategies that are successful.

W Work to achieve a standard of business performance compatible with other dealers worldwide.

The Environment E

The environment in which the dealers found themselves was that they were resigned to the idea that they were unable to achieve the expectations of the manufacturer. They rationalised this concept with reasons such as uncompetitive pricing, customer dissatisfaction and economic conditions. The business lacked the thrust of an assertive leader. Also, as this dealer was geographically isolated from other dealers, they were not exposed to challenging business parameters on a day-to-day basis and gradually accepted lower standards of performance.

E An environment of diminished levels of achievement characterised by acceptance of mediocre business performance.

The Customers C

The customers of the transformations are the business owners; in this case the family shareholders. The employees will also be indirect customers, as they will benefit from a more viable and profitable employer.

C The customers are the owners of the business

The Actors A

The people who have to carry out the transformation are the company directors, management and the senior level employees. This is enacted with the facilitation of the manufacturer's representatives and consultants.

A The actors are the directors, management and all responsible employees.

The Owners O

The system is answerable primarily to the shareholders as a business operation, however, if this business cannot or does not provide sales and service to a satisfactory level, the manufacturer is likely to terminate the agreement and seek another party as dealer for that territory. The dealer could also terminate the agreement if they felt the business opportunity for them was unviable. In this case, the party likely to be proactive in making a decision as to the future of the agreement is the manufacturer.

O The manufacturer is the Owner of the system.

A statement of the root definition is given in Table 6.8.

Table 6.8 Statement of Root Definition – Case No. 3

Statement of Root Definition
A cultural and attitudinal change, initiated by the manufacturer, to bring the dealer performance up to acceptable levels, commensurate with other dealers, in an environment of conservatism and financial restraint.

6.4.3 Development of the Conceptual Model

The conceptual model illustrates the parameters expected of a viable dealership operation as seen by the manufacturer. The model is shown in Figure 6.7

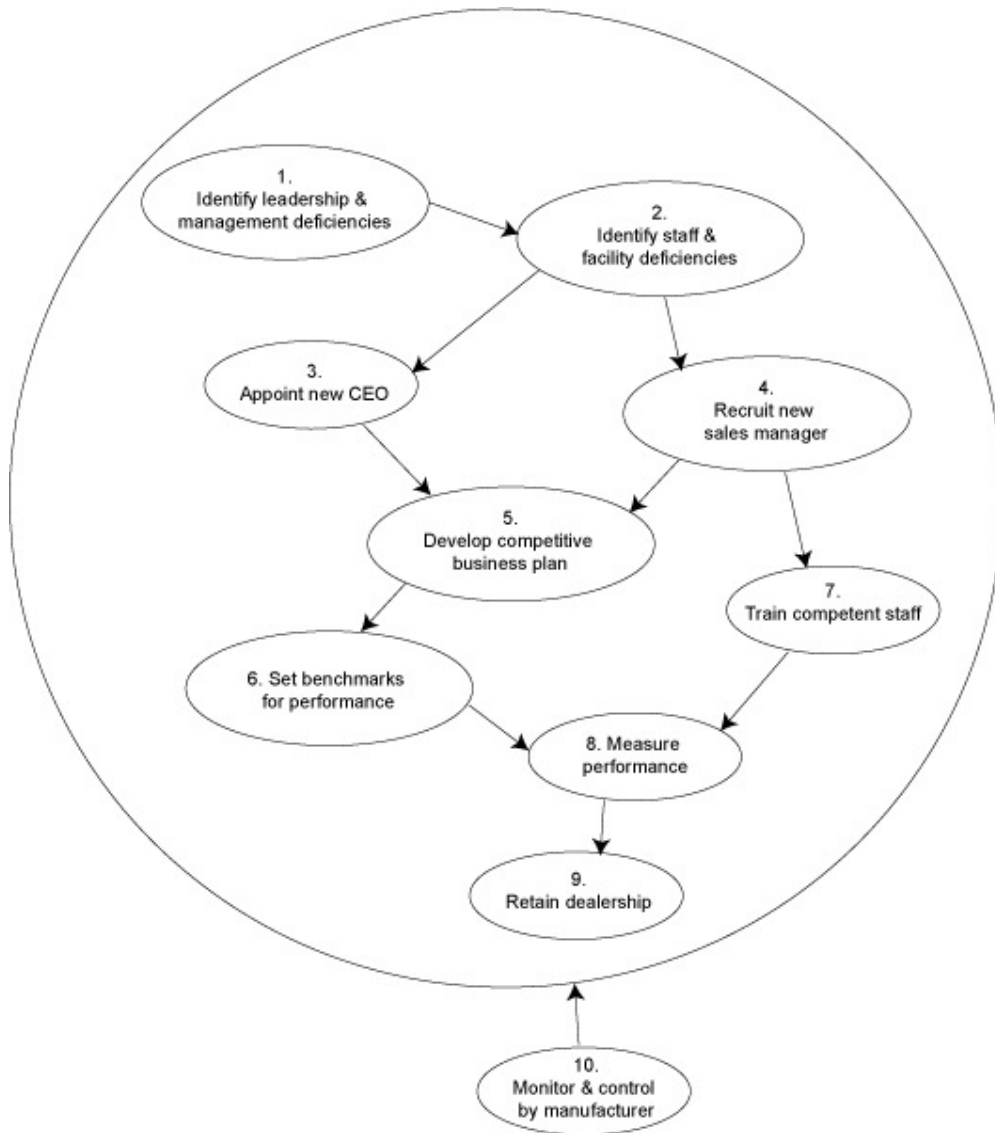


Figure 6.7 Conceptual Model of a Dealership Problem - Structured

The elements of the conceptual model are expressed in the following Table 6.9. The performance targets that are the key measures of interest to system owners are shown in the business plan in Appendix A. Other business measures are used to evaluate the dealer principal's investment.

Table 6.9 Elements of the Conceptual Model – Case No. 3

Elements of the Conceptual Model
Identify leadership and management deficiencies
Identify staff and facility deficiencies
Recruit or appoint suitable candidates
Develop a competitive business plan
Set benchmarks for performance
Train competent staff
Measure performance
Monitor and control the process

Comparison of the Conceptual Model with Reality

Apart from the position of dealer principal, the structure of the dealer's business is normal and typical of other dealers. The manufacturer's formula for success is to have the principal investor as dealer principal and CEO. The main difference between the rich picture and the conceptual model is the method and extent to which the dealer's skills and resources are deployed.

The conceptual model is compared to reality as depicted in the rich picture and from that comparison, changes are proposed to achieve the ideal outcomes as shown in Table 6.10.

Table 6.10 SSM Comparison Stage – Case No. 3

Conceptual activity	Reality	Proposed change activity
Identify leadership and management deficiencies	Owner with power and control but dysfunctional	Replace chairman and CEO
Identify staff and facility deficiencies	Lack of leadership and professional management	Define person and job specification
Recruit or appoint suitable candidates	No capable candidates in the organization	Recruit competent divisional managers
Develop a competitive business plan	Loss of confidence and competitive edge	Develop aggressive business plan
Set bench marks for performance	No acceptance of reality of current benchmarks	Demonstrate achievability of targets
Train competent staff	No effective training programs in place	Introduce staff training at all levels
Measure performance	Mediocre performance accepted	Set challenging levels of performance
Monitor and control the process	Limited and ineffective monitoring and control	Competitive position re-established.

To achieve these desired changes, the following three areas of desirability and feasibility were addressed:

Attitudinal Change

Interviews with the sales team revealed a surprising lack of depth in selling skills. As their product was the market leader, many sales representatives relied on the customer approaching them with sales enquiries. In some cases, the representatives were in awe of their customers, who were often powerful and wealthy businessmen, and were restrained in their approach to selling. Selling skills based on knowledge of product performance and specification was conspicuous by its absence. Similarly, selling skills based on the overall economic return and earning ability of the product was lacking.

Relationship selling was also a problem. Representatives made numerous calls on clients without delivering a selling message or progressing a sale. This resulted in an

unacceptable high cost-of-sales ratio when compared to the dealer network average. Some customers reported that long running disputes over costs or supply issues had never been resolved. Relationship selling at senior level was almost non-existent. A customer who was the head of the forestry department, one of this dealer's major market segments, had never had contact from a senior member of the dealer's management. This lack of influence at senior level resulted in heavy sales losses in the forestry market. The problem was focused in two areas. The chairman and dealer principal was a conservative retiring type who had poor social skills and avoided contact with customers. The general manager, who was in fact the CEO, did not recognise the need for customer contact at senior level with this class of customer.

Discussions from the SSM process suggested the sales training problems be referred to the new sales manager who had experience at a high performing dealership. Also, the idea that the CEO should meet with the heads of large client organizations to promote the strengths of the dealership's role in product support was suggested.

Structural Change

The major structural change required by this company was at the top. The manufacturer encouraged the family to make significant changes. The first was to select a family member who had the qualities and talent to lead the company with vision and vigour. A grandson of the founder who was a graduate engineer in his early thirties with experience in facilities planning was chosen and proved to be successful. The second structural change was the selection and appointment of a capable independent chairman of the board of directors. This was required to introduce a strong business focus at board level and enabled the senior family members to retire gracefully. The former chairman had a tendency to pursue ideas that would ingratiate the family name but had little or no business results.

The SSM group suggested the introduction of an in-house finance facility. This was seen as a profit opportunity and was indicative of the creative ideas generated by the SSM process.

Procedural Change

Apart from the urgent need for sales training to levels of competence, there were two other areas of procedural change highlighted by this study. One was in warranty administration and the other in parts inventory policy regarding returned stock.

Warranty cost in this dealership had grown beyond the factory benchmark average, indicating a problem with warranty administration. Interviews with the staff concerned revealed they were being persuaded to extend warranty settlements by strong argument presented by their customers, rather than on decisions based on fact. Warranty adjustments were being made to those customers who complained the loudest rather than on the basis of the fault at hand. In this way the dealer had provided a de facto training exercise to the customers on how to win warranty claims. The SSM process suggested a review of skills in analysing mechanical failures and dealing with irate or disenchanted customers supported by expertise from the factory.

Parts inventory policy is based on forecast and actual machine sales, forecast replacement requirements for consumable and wearing components and on parts order frequency. Forecasting methodology is statistically based on Poisson distribution of demand. Under the dealer agreement, surplus parts stock and unsold or unwanted stock could be returned to the factory if it is in a saleable condition. The dealer is refunded the purchase price less ten percent and is obliged to pay the return freight. Acceptance of parts returned from customers was at the discretion of the dealer. No policy was in place for guidance on management of this issue.

Interviews with customers revealed that this was an area with a high level of discontent. Customers had purchased parts that proved to be incorrect, however, the dealer had refused to accept their return. This had resulted in simmering discontent on the part of the customer that had in turn resulted in lost sales to the dealer. Discussions in the SSM workgroup revealed that the dealer would readily accept surplus parts returned from the workshop, but not from customers. This was indicative of another problem whereby workshop staff would over-order repair components, then return the surplus “to ensure they had the required parts in stock”. This practice, which was effectively parts inventory management by stealth, indicated shortcomings in the inventory management process.

The SSM group proposed a parts return policy, giving seven days, fourteen days and thirty day return policy with respective discount levels of refund. The policy was to be printed on the parts invoice. This was also indicative of the creative outcome of the SSM process.

Lessons Learnt

Part of the problem of dealing with family businesses is the devolving ownership and responsibility as the family grows through generational advancement. In this case, the second generation had few of the abilities of the founder yet retained the authority and decision making. Some of the third generation were wasters that presented an ominous outlook and obfuscated the future of the company. The lesson learnt here was that the third generation family members, who took part in the SSM process were able to hear views expressed about their business that were unknown to them. Apart from shock and surprise, they were able to contribute some creative ideas and were stimulated to be involved in the recovery process.

Another lesson was the importance of the role of the CEO in promoting the company to senior levels of the potential customers. In this particular case, the territory in which they operated was quite conservative in business relations, and representation at the highest level was critical for acceptance and subsequent success. This was brought to the attention of family members through the SSM group process.

In terms of the overall attitude of the management and staff of the dealership, a certain amount of isolation from the wider market place along with conservative and parochial attitudes had resulted in a degree of defeatism and a pragmatic approach to business performance. The manufacturer encourages travel for operating managers to other markets and other dealers' businesses to broaden outlook and experience and heighten expectation of their own workforce. The manufacturer also offers specialised training of the sons and daughters of dealer principals in the successful management of a dealership.

The former CEO's eventual personal representation to the somewhat self-important captains of industry in their territory resulted in turnaround of attitude by the

customers that reaped an increase of \$11 million of sales to this sector over a five-year period.

Points of Leverage

The driver for change in this case was the restoration of confidence in their ability to achieve results commensurate with their opposite numbers in other territories. This was primarily in the hands of the sales force and the other customer contact people such as the parts sales and service staff. Discussions in the SSM groups with sales representatives raised concerns about their ability to address some of the objections raised by customers. Agreement was reached on a new direction of sales effectiveness. The new sales manager was also able to introduce sales training techniques that revitalised the sales force and gave them professional level skills in dealing with their customers. The sales training techniques introduced by the sales manager highlighted the weaknesses in their abilities. This reflected the experiential learning gained by the sales representatives in the SSM process. Having the opportunity to develop their skills in a non-threatening environment provided the leverage needed to make the critical change in performance for this company.

The participation by the third generation family members in the SSM process provided the insight and enthusiasm for accelerated change in this company. Rather than being excluded and endowered, they sought active participation in ensuring their future livelihood. Their previous position had been clouded by uncertainty about their role in the company. In due course, one of their members was made CEO and successfully managed the business.

Hidden Issues Raised

An issue raised by the study was that eighty per cent of the dealer's customers were in different cities and locations to the dealer's head office. It was revealed that the head office and centre of operation was located in the hometown of the family rather than the centre of business. As the family were very parochial, they did not consider a move to a more accessible location for their customers. This also required an attitude change and was raised in discussions in the SSM group.

6.5 Case Study No. 4: Logistics Changes in a Clothing Manufacturer

6.5.1 Background and Problem Situation - Unstructured

A large Australian work-wear and industrial clothing manufacturer was faced with a storage and distribution problem of their product. In the present situation, both the manufacturing facility and base warehouse, which also served as the main distribution centre, were located in the same single story industrial building situated in an outer suburb. An additional small warehouse that stored industrial wear was located ten kilometres across town. Distribution centres were also located in the five major Australian capital cities as well as at one of the large interstate open cut mines. All work-wear, shorts and jeans were stored as flat goods in solid timber built racked bins known as stock keeping units (SKU), and represented 80 % of the stored stock. The remaining 20% of products, which were uniforms and items sold by department stores, were stored as hanging goods on slick-rails. Slick-rails (or slide-rails) are an overhead rail conveyor system where garments are hung vertically on hangers and can be moved quickly along the rail system to other locations within the building. Plastic covers are used to protect each garment. Slick-rails can be powered or manually moved. The installation in this organization was manually operated and was used as a storage and assembly facility prior to shipping on slick-rail equipped trucks. Most large department stores used slick-rail systems for receiving and storage of stock. All inventories were managed by a computer based stock control and order entry system.

The company faced increasing costs and complexity in managing stock level across the range of locations. Demand at some locations showed a stockout, whilst other locations had surplus stock. To fill some orders, stock had to be transferred from some branch stores back to the main warehouse. To satisfy demand and delivery requirements, stock was increased at all sites to avoid lost sales to competitors. This created a national overstock position. It also had the potential of creating an out-of-control demand and supply problem known as the bull-whip effect.

There was insufficient room at the base warehouse to store more products using the existing storage methodology. Also, there was congestion from inwards and outwards goods using the same access door. The CEO was a senior member of the owning

family who had worked past normal retirement age. Interviews with the CEO revealed that he was comfortable with the SKU storage system, although it consumed all the available floor space. He had moved to slick-rails to meet the requirements of major retail customers. Garments on slick-rails can be moved into a truck fitted with slick-rail for transit. The truck then delivers the garments to the retailer's slick-rail system where they are stored ready for sale or display. One person can do the transfer of a large number of garments easily and quickly. Handling of garments stored as flat goods in SKUs is much more labour intensive, as garments are more or less handled one at a time, and is open to errors caused by the possibility of mixing sizes and styles. Garments in SKUs are also more susceptible to being soiled by dust or careless handling. No conveyor system was employed with flat goods.

Interviews with management and staff revealed that the second warehouse had eased storage problems but had not eased delivery problems. Stock control was further exacerbated at the time of the study by shortcomings in the computer network between the main warehouse and the secondary one.

Manufacturing lead times were relatively short, usually a matter of days, however, not all products were manufactured simultaneously. Some stock was seasonal; some was bulk orders from large customers and others were continuous demand. With continuous demand stock, various styles were made in batch quantities and stock carried in the warehouse until sold or the next batch was scheduled. This meant that a manufacturing cycle of many items occurred every three months. The result was that the warehouse had to accommodate large quantities of finished goods in addition to the regular merchandise stock. Contracts with large work-wear customers such as mining companies required stocking of a wide range of sizes and fittings to accommodate all their employees. This generated an abnormal number of slow moving items that had to be accommodated. Orders placed on suppliers for finished goods also have to be accommodated. These consisted of large orders that were typically three months supply.

These demands and constraints resulted in an overcrowded warehouse facility, which limited retrieval and storage flexibility. Within this crowded environment, some

space was poorly utilised by storing slow moving items in standard sized SKUs. In some case the quantities were only one or two items.

Soft systems methodology was applied to identify solutions to the logistical problems of storage, stock control and materials handling. A group consisting of management staff, senior employees and the consultant was set up for the SSM process. Neither the CEO nor any process workers participated in the group, however, union representatives from the manufacturing and packing lines did participate. Other production employees were not made available to participate in the group discussions but they were available for interview and contributed freely to the discussion, although with limited creativity.

A rich picture of the problem situation is presented in the following Figure 6.8. The rich picture was established from interview and observation with the management and the employees.

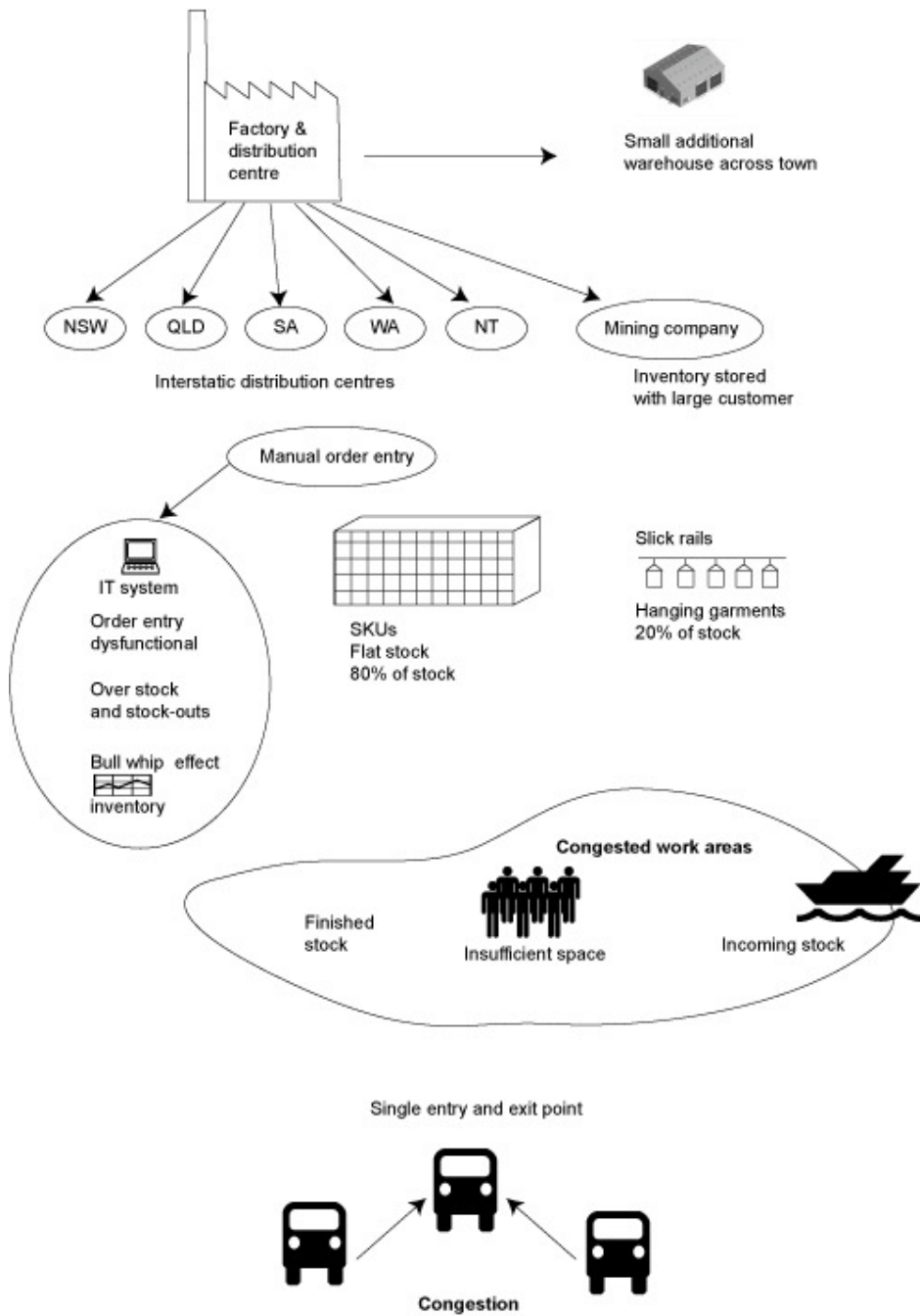


Figure 6.8 Rich Picture of the Problem Situation – Expressed Logistics of an Industrial Clothing Manufacturer

6.5.2 The CATWOE Components

Transformation T

The transformation required by the company was such that they should make the best use of the space available in their existing facilities and so satisfy customer orders for their goods in a timely manner whilst optimising storage and handling costs. This required a change in the way they built up stock for large orders, the way they stored existing stock, the stock levels they maintained and the way they distributed their stock.

T Provide an efficient and effective inventory management system, in particular the storage and distribution elements.

Worldview or Weltenshauung

The view of the system changes could be from the employees who have to struggle with the congested warehouse, the clients who have to suffer delays and potential errors in shipments, and the manufacturer who is frustrated by the congestion, high inventory holding costs and lack of suitable storage space. The worldview of the manufacturer is considered the most relevant in achieving the necessary transformation.

W A warehousing function capable of handling the quantity and range of products produced and distributed.

The Environment E

The environment surrounding this transformation is the existing wide range of product sizes and styles produced; the physical constraints of the building site whereby no lateral expansion was possible; the reluctance of the business owner to adopt modern technology in warehousing practice; the nationwide market for their products requiring a comprehensive distribution system and competitive pressure. These physical constraints introduced additional handling cost pressures on the business.

E The physical constraints of the business premises.

The Customer C

Although all parties in the organization's system will benefit from improvements in the warehouse logistics, the most relevant beneficiary will be the company owners and operators.

C The customers of the transformation are the company owners and managers.

The Actors A

The people concerned with the transformation are the employees and the company managers. The managers will be concerned with the warehouse logistics structure and process and the employees will be concerned mostly with the process.

A The actors are the company managers and those employees involved in the proposed process change.

The Owners O

The owners of the process are the chief executive and ultimately the company directors.

O The owner is the chief executive of the company.

A statement of the root definition is given in Table 6.11.

Table 6.11 Statement of Root Definition – Case No. 4

Statement of Root Definition
An organisational change in warehouse logistics, initiated by the CEO to achieve a cost effective and space effective storage and distribution facility.

Development of the Conceptual Model

A conceptual model of the ideal storage and distribution system is presented in the following Figure 6.9.

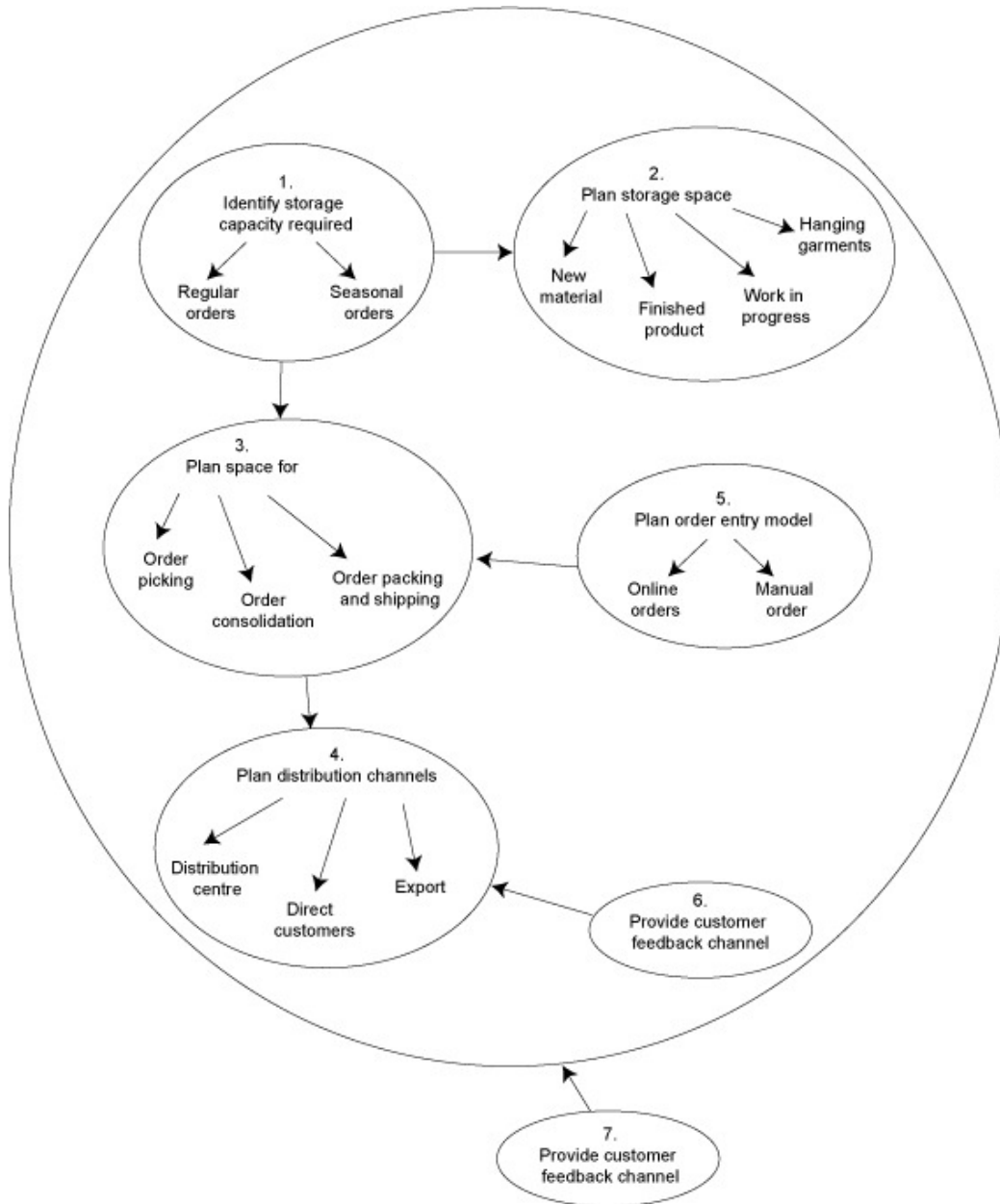


Figure 6.9 Conceptual Model of Storage and Distribution System - Structured

Comparing the Conceptual Model with Reality

The conceptual model shows the outcomes of the iterative process. It illustrates a flow of products from the factory to the warehouse, from the warehouse to distributors or in some cases, direct to customers. The steps required are shown in the diagram and are listed in the following Table 6.12.

Table 6.12 Elements of the Conceptual Model – Case No. 4

Conceptual Model Elements
Identify Storage Capacity Required for: <ol style="list-style-type: none">1. Regular Orders2. Seasonal and Bulk Orders
Plan Storage Space for: <ol style="list-style-type: none">1. New Material2. Finished Product3. Work in Process4. Hanging Garments
Plan Space for Order Picking, Consolidation and Packing
Plan Distribution Channels: <ol style="list-style-type: none">1. Distribution Centre2. Direct Customers3. Export Orders
Plan Order Entry Model: <ol style="list-style-type: none">1. On line Orders2. Manual Orders, Phone, Email etc.
Provide Customer Feedback Channel
Monitor and Control

The conceptual model is compared to reality as depicted in the rich picture and from that comparison, changes are proposed to achieve the ideal outcomes as shown in Table 6.13.

Table 6.13 SSM Comparison Stage – Case No. 4

Conceptual Activity	Reality	Proposed Change Activity
Identify Storage Capacity Required for: <ol style="list-style-type: none"> 1. Regular Orders 2. Seasonal and Bulk Orders 	Storage dispersed across numerous warehouses in different states	Consolidate stock in one central distribution centre
Plan Storage Space for: <ol style="list-style-type: none"> 1. New Material 2. Finished Product 3. Work in process 4. Hanging Garments 	Congested flow of material Some materials stored in aisles. Finished product stored on trolleys not in locations. Hanging garment slickrail system installed piecemeal with limited coverage	Structure flow of material and work. Separate inbound and outbound stock. Install comprehensive slickrail system. New door for outbound goods
Plan Space for order picking, consolidation and packing	Packing presently centrally located, not near exit. No room for order consolidation	Located outbound activities together. Include space for order consolidation
Plan Distribution Channels: <ol style="list-style-type: none"> 1. Distribution Centre 2. Direct Customers 3. Export Orders 	All orders received centrally but processed at individual distribution centres	Close all other distribution centres and consolidate distribution centrally
Plan Order Entry Model: <ol style="list-style-type: none"> 1. On line Orders 2. Manual Orders, Phone, Email etc. 	Order entry system incompatible with computer system. Multiple crashes & confusion	Upgrade order entry system to include web based input, credit control and generation of picking slips
Provide Customer Feedback Channel	No established channel available for customer feedback	Develop customer feedback system and encourage its use
Monitor and Control	Production and sales reports to CEO	Accurate costing of stock turnover, distribution costs and productive use of space. Customer feedback available to management.

The participants were asked to consider how they would approach the task in a new greenfield site. The conceptual diagram represents the ideal situation considered without the constraints of the present facility. To achieve these desired changes, the following three areas of desirability and feasibility were addressed:

Attitudinal Change

The management had decided on the manufacture of a line of economy products with department store branding. Although these represented high volume orders, their total cost was questionable when considering the need to manufacture and consolidate stock before delivery, incurring storage problems and holding costs. The concept of a total cost review was raised in the SSM groups.

Management, and the CEO in particular, were reluctant to use the latest technology for stock control. Barcoded labels were in use but RFID (Radio Frequency Identification) was not being used and could be considered. Picking of individual items was all by manual means. No mechanisation was considered.

Structural Change

A review by the SSM group of the warehouse floor plan and part of the manufacturing space suggested that all present stock could be accommodated in the present warehouse with the use of a mezzanine floor. This would obviate the need for a secondary warehouse across town and the associated difficulties with data communications and stock transfers being experienced with that site. Although traditional warehouse design calls for a single story building, the present site has sufficient height to accommodate a mezzanine floor without infringing building regulation or OH&S regulations. Present access methods to SKUs could be utilised on a mezzanine floor and also slick-rail can be routed to upper levels such as mezzanines.

Access to the building by constructing another door was also suggested, providing separate inward and outward loading and unloading docks could improve associated material flow. This presented another space related problem, as the additional road way required for the inward goods door would consume some of the factory car parking spaces. This in turn would contravene local municipal bylaws that required certain minimum numbers of off-street car parking spaces related to the number of employees. To overcome this constraint, the group proposed that a small maintenance storage shed be removed to provide extra car parking space.

Procedural Change

The concept of establishing and servicing distribution centres in each state was questioned. The alternative was to hold all stock at the main warehouse and distribution centre and ship to retail customers from there. This would enable a reduction of the overall inventory held and an increase in the service level of customer orders due to the elimination of stock fragmentation. Urgent customer orders could be airfreighted or sent by overnight road transport at less cost than having a local distribution centre. The exception to this concept was the mining company stock. This stock was dedicated to this customer and was not sold to others, as it was in a corporate safety colour and was in a chemically treated fire resistant material. The group proposed to negotiate with the mining company for them to hold all stock on consignment.

Lessons Learnt

As all business organisations depend on their external environment for survival, this manufacturer found themselves in a fortunate position. Their product consisted mainly of work wear, jeans and outdoor casual wear. The market for these products was relatively stable and was separated from the fashion industry by being a service product rather than fashion apparel, which changed frequently with seasons or style. The product's appeal was centred on quality, toughness and serviceability. They also had an element of cultural and emotional advantage by being a traditional Australian made product with a traditional Australian name.

These advantages meant that they could forecast projected sales with relative accuracy and could safely consolidate their stock and supply retailers direct without the threat of lost sales due to delays in distribution. This in turn allowed them to adopt a leaner inventory management scheme.

Point of Leverage

The outlook for clothing manufacturing in Australia is bleak. The manufacturing of apparel is labour intensive, particularly in the assembly, sewing and finishing. The labour content of apparel is in the order of 60-70 % of the finished goods cost. The cutting stage is mechanised and this company had employed the current technology in

Gerber cutting machines. However, the sewing and assembly stage is where the labour costs are accumulated. Efficiencies of movement and process have been applied over time; however, the real threat is from low labour cost countries. The minimum wage in Australia is approximately \$17 per hour, whereas, in China it can be as low as \$1 per hour. Manufacturers have to compete with importers who have the advantage of low production costs. This indicates that future production will likely be imported or outsourced to low cost production areas. If the company moves to this strategy, it will release space for warehousing in the present facility.

Apart from manufacturing costs, the other significant cost drivers are in storage, handling and distribution. By adopting a more strategic approach to their in-house and outbound logistics by consolidating and refining the organization to a more strategically competitive structure, the group considered that they would be able to maintain a competitive edge over their competitors.

The experiential learning generated in this case was in discussions with management and employees, where they were asked to give reasons why processes were in place. Assumptions regarding customer requirements, management expectations and alternative processes were raised and challenged. This process generated a number of alternatives that were explored in order to arrive at the projected solution. Employees highlighted many perceived constraints, much to the surprise of management, which were resolved in the planning stage. The group was aware that some lines were presently imported as finished products, and that this trend was likely to increase in order to maintain cost competitiveness. Concerns raised by employees in the SSM groups related to future employment and the viability of the company in light of foreign imports and the demise of other manufacturers. These concerns were expressed to management with the approval of the employees. Management assured them that their future was secure into the foreseeable future as they were still hiring new employees.

The most significant point of high yield was the accommodation of views concerning the consolidation of stock in one location. The group was able to reach a consensus on the changes considered necessary and recommended to the CEO that the change process start immediately.

Hidden Concerns Raised

It became apparent during the study that the company was experiencing a high number of repetitive strain workplace injuries. Further investigation revealed that the injury rate was far in excess of the industry norm and seemed to be isolated to this company. During group discussions with the Human Resources Manager, the suggestion was put to vary the recruitment practice of hiring local employees, as employees reported that the company had become known locally as a potential target for malingering employees.

6.6 Case Study No. 5: A Secondary College Enrolment System

6.6.1 Background and Problem Situation – Unstructured

A traditional independent girls secondary college, owned and operated by a religious order and located in an outer suburb, has an enrolment of around 800 girls, providing five streams of classes from year 7 to year 12 inclusive. The curriculum provides English, Mathematics and Science, together with a small range of optional courses in languages, Geography, History and Physical Education etc. Elements of Christian religious education are also provided. The ethos of the school is based on the mission of the religious order, which was expressed as providing a quality education for young women, so enabling them to contribute to society in a meaningful and responsible way, with a strong appreciation of ethics, equity, morality and social justice. The college was founded more than 150 years ago with the mission of educating girls from working class and disadvantaged families. At the present time, it still caters for working families on a more regional basis; however, students can attend from any location. The college has built a reputation for very good academic results, and for the formation of young ladies with the social and behavioural graces that have enabled them to achieve success in many professions and vocations, including public life.

Funding for the college is by means of enrolment fees, and grants from the federal government. Fees are charged annually and are modest by comparison to other independent schools. Grants are received from the government and are distributed to schools by a central religious education office. This body decides the amount of grant going to each school on a socio-economic basis. The number of students enrolled on February census day determines the number of grants. Grants for this school are approximately 50% of the fees charged per student and classified as being in the low to medium socio-economic category. The college employs one hundred academic, support and administrative staff.

The college is under threat from falling enrolments. As enrolments fall, fees and grants are reduced accordingly. A sharp drop in enrolments can create a financial crisis in the college, as they operate on a tight budget. Families in the region are maturing, so the number of students attending feeder primary schools has declined.

Younger families with children of secondary school age are moving further out to new residential areas. In addition, there is a constant attrition of students for other reasons such as relocation of parents, scholarships to other schools etc. The rate of attrition may wax and wane depending on economic and social conditions at the time.

All schools in the region, both independent and state, are competing for students. Some single sex schools have moved to a coeducational format. Although this may be done for a number of reasons, it does have the effect of consolidating enrolment numbers. The college under study has maintained their mission of providing education for girls only.

In its effort to maintain or grow enrolments, the college is faced with a series of complex problems presented by a more dynamic and demanding client base with changing social standards and culture. The nature of changes in family structure with more divorced parents, single parents and third parties involved in enrolling their students can result in messy situations regarding the student-parent-college relationship. The college is also constrained by their religious mission. They can accept students from any faith; however, they are obliged to give first preference to students from primary schools of the same denomination as themselves. Present figures reflect an 80% enrolment of their own denomination.

Soft Systems Methodology was employed to address the problem and to help generate a range of optional pathways that can take the college forward into the future at a viable and sustainable level.

An analysis of the present situation is depicted in the rich picture shown in the following Figure 6.10

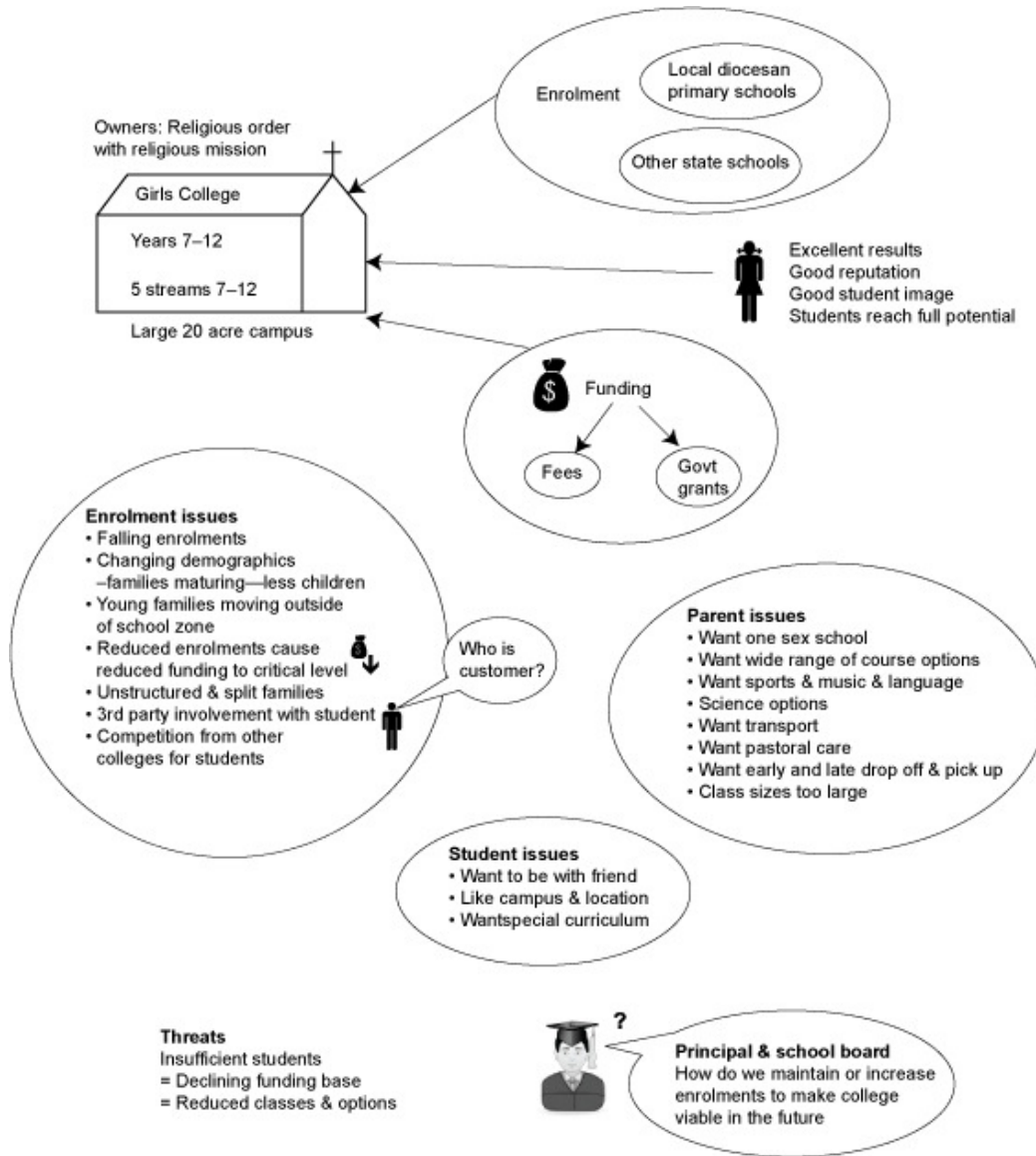


Figure 6.10 Rich Picture of the Problem Situation - Expressed College Enrolment Problem

6.6.2 The CATWOE Components

Transformation T

One of the demands and expectation of present day parents is a reduction of class sizes from 29 students to 25 students. To accommodate this requires a change in the structure of the college from five streams to six streams of students from year 7 to year 12. This in turn means additional resources of staff and facilities and a reduction in the flexibility of student numbers if the six streams are to be maintained. Parents are also looking for more curriculum choices, which may result in a number of smaller classes. The change required is to recruit and maintain enrolments for six streams of students.

T Move to six streams of students with class sizes of no more than twenty-five.

Worldview or Weltenshauung

The pertinent view concerning the capacity of the college and its future direction would reasonably be assigned to the owners of the college. When the college was founded, it was staffed entirely by female members of the religious order. Over time the numbers of women entering religious life has declined so that they no longer have the ability to staff all their facilities. At the present time, their schools and hospitals have been restructured as corporations, with management authority delegated to boards of directors. Each board has a delegate from the religious order who represents the interests and mission of the order. In this case, it is the view of the board of the college, supported by the view of the order that is the pertinent view.

W Maintain the educational, social and economic position of the college by moving to six streams of twenty-five students.

The environment E

The environment in which the college operates is a cross section of the present social, economic and cultural society. The college has to compete for students primarily with other independent schools, and to a lesser extent with the state high school.

Competition can be on the basis of academic results, location, transport, curriculum choices, sport, music etc. It can also be strongly influenced by the quality of the teaching staff and the facilities and resources of the school. As an independent

denominational college, it is obliged to give first preference to students from denominational primary schools, and in particular, schools within its geographic region. Enrolment is also declining at these feeder schools due to changing demographics. The limited availability of transport from the newer residential areas is also a constraint on potential students, as is the trend for parents to drive their children to school. Most families now have both parents working and are time-constrained in their ability to deliver and pickup students at school opening and closing times.

At the present time with economic instability, parents who have lost their job are likely to remove their child from a fee-paying school and send them to the high school.

E An environment of uncertainty and declining enrolment base.

The Customer C

Although a school can be seen to have a number of customers depending on the viewpoints of various stakeholders, such as the students, the parents, the government, the religious order and the community, the predominant customer in this case are the parents and other individuals who make enrolment choices. The parents are also highly influenced by their childrens' wants.

C The Customers are the parents or their representatives.

The actors A

The individuals concerned with affecting the transformation are those parties responsible for carrying it out. Here it will be the board, the principal and the management staff.

A The college board, the principal and the senior staff.

The Owners

The owners are those stakeholders to whom the system is answerable. Here it is not only the direct stakeholders such as the board, the principal and the senior staff, but

also the indirect stakeholders such as the superior of the religious order, the denominational education office and the local religious superior or archbishop.

○ The owners are the board and principal of the college with some influence from other stakeholders.

A statement of the root definition is given in Table 6.14.

Table 6.14 Statement of Root Definition – Case No. 5

Statement of Root Definition.
A change in the enrolment system to establish and maintain a viable six stream program to the satisfaction of the owning stakeholders in an environment of changing demographics and parent requirements.

6.6.3 Development of Conceptual Model

A conceptual model for the ideal establishment and maintenance of a viable six-stream enrolment program is shown in Figure 6.11.

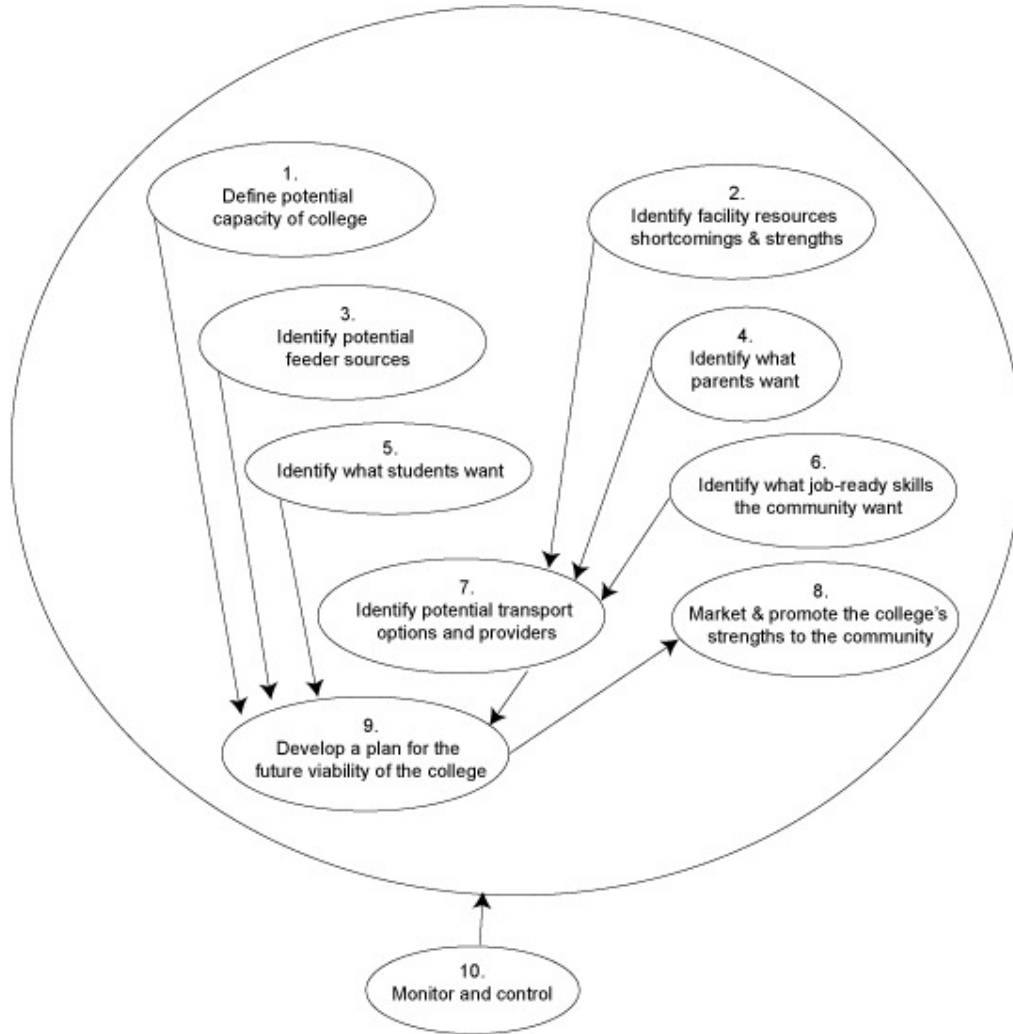


Figure 6.11 Conceptual Model of Enrolment System - Structured

Comparison of Conceptual Model with Reality

In a previous era, the college had to turn away students as they always had a full complement. Under pressure from parents, additional students had been accommodated by increasing class sizes up to twenty-nine pupils. As discussed earlier, this is no longer acceptable to parents. As the college has always had an abundance of new entries, they had no mechanism for recruiting or attracting potential students or for dealing with demographic changes. The conceptual model illustrates an ideal enrolment and maintenance system. The following Table 6.15 shows the elements of the model.

Table 6.15 Elements of the Conceptual Model – Case No. 5

Elements of the Conceptual Model – Case No. 5
Define potential capacity of college
Identify facility resources or shortcomings
Identify potential feeder sources
Identify what parents want
Identify what students want
Identify what job-ready skills the community wants
Identify potential transport options and providers
Market and promote the college's strengths to the community
Monitor and control

The conceptual model is compared to reality as depicted in the rich picture and from that comparison, changes are proposed to achieve the ideal outcomes as shown in Table 6.16.

Table 6.16 SSM Comparison Stage – Case No. 5

Conceptual activity	Reality	Proposed change activity
Define potential capacity of college	Additional students are squeezed into existing classes	Move to a six stream format with class sizes of 25 students
Identify facility resources or shortcomings	Crowded classrooms, limited technology	Relocate senior classes to recently vacated buildings and build additional space
Identify potential feeder sources	Local primary schools numbers declining	Market college to new residential areas in north west
Identify what parents want	Attrition due to parents seeking different curriculum options	Interview prospective parents for feedback on expectations
Identify what students want	Expectations of a wide range of extra-curricular activities unfulfilled	Provide an increased range of extra-curricular activities
Identify what job-ready skills the community wants	College presents courses commensurate with their tradition	Introduce vocational course stream. Monitor tertiary course demand
Identify potential transport options and providers	The college is served by public bus and train transport from north-south locations	Engage buses to service outer suburbs with numerous potential students
Market and promote the college's strengths to the community	College has a significantly high level of academic achievement which is not promoted	Promote results, facilities, courses to community
Monitor and control	Principal responsible for all functional activities	Appoint a registrar to manage enrolments, promotions and development

To achieve these desired changes, the following three areas of desirability and feasibility were addressed:

Attitudinal Change

The main change in attitude at the college was the realisation that the viable future of the college depended on proactively attracting students. This required a SWOT analysis of their situation and a business plan to resolve the problem. Discussions in the SSM group suggested the need to look further afield for new students and to reconsider the philosophy of maintaining a single sex school.

Structural Changes

Feedback from parents indicated a strong wish list of pedagogical and administrative requirements. Among these were strong interest in academic results, reduced class sizes, the availability of pastoral care, the acceptance of children with special needs, an absence of discrimination and an acceptance of diversity, an expectation that the college would have the current technology in Science and IT, and an expectation that they would have access to the principal on matters of serious concern. There were also calls for a wider range of language, sport and music course offerings.

Family sizes have reduced with most having two children. With both parents working, they are time scarce and where they have a boy and a girl, some expressed a desire to deal with only one school. However, more parents expressed a strong desire for a single sex girls' school. The prevailing attitude of a single sex school was maintained in this case. The SSM group were ambivalent on this point however, the college directors decided in favour of maintaining the present status in order to concur with the philosophy of the religious order.

The SSM group reported a number of initiatives that had been suggested by the senior staff. Some buildings had become available with the recent relocation of members of the religious order. This provided an opportunity for the college to establish a dedicated year 12 campus within the college grounds, with specialised study and resource areas for senior students. This was particularly attractive to the senior students as it was helpful in preparing them for tertiary studies. It was also a very appealing vision of the future for prospective students. Another initiative was the establishment of the position of a full time college registrar to manage the enrolment process. This would provide a highly professional level of service in this functional area and free the principal and other staff from these duties presently being undertaken on a piecemeal basis.

Another initiative suggested by the staff was the introduction of a vocational studies stream in office administration. This course would have multiple benefits as it would provide keyboarding, clerical and administrative skills for those students not taking tertiary studies, and it would give the advanced students an extra ten per cent to their final score in year 12, boosting their tertiary acceptance level.

The need was also expressed to improve the management of traffic in mornings and evenings as congestion and traffic hazards were occurring with the growing number of cars and buses arriving, entering or departing the college grounds. A circular driveway with a drop off and pick up areas was proposed along with a separate area for bus traffic.

Procedural Changes

To promote the college, a number of open days, college tours and twilight tours were proposed. These were to be supported by advertisements in local community newspapers. The new registrar, together with a number of students would conduct daytime tours. This could provide the prospective parents and students with a real world example of the student formation and culture of the college. It would also be an opportunity to promote the high level of academic achievement of the college. The opportunity to meet the principal and discuss the student's future at the college was considered to be significant attraction to prospective parents.

Interview participants suggested the introduction of a number of special chartered buses that would pick up students from outer areas and new residential zones not serviced by public transport. Enquiries were made with bus companies and a pilot program was initiated on a subsidised basis to see if a full busload could be sustained. This has since proved most successful. The buses also carry promotional advertisements for the college, another suggestion raised by the SSM groups.

Parents' interviews revealed that part of the attraction to a school by prospective parents was the behavioural conduct, language and presentation of the students as witnessed by the public, when the students were travelling to and from school. The college recognised this and moved to promote this aspect strongly to the students and reinforced their message with a high standard of dress for arriving and departing students. The responsibilities of the college to the students and its duty of care were to be articulated in a Students and Parents handbook. This would also outline the college's expectations of parents and students as members of the college community and would contain a full description of the college policies on education, fees, uniforms and student management.

Exit interviews for parents and students who chose to leave the college were proposed as a means of obtaining feedback on reasons for loss of retention of students. Parents are not always forthcoming about the real reasons for removing students from the college. Discussions with parent in forums such as parents' associations proved fruitful in revealing reasons for exits other than those expressed earlier.

Lessons Learnt

The lessons learnt in this case were that the changes requiring attention were partly internal where the college had control, and partly external where the college had no direct control, and could be considered coercive circumstantial changes. Moreover, the external changes resulting in a declining enrolment base also meant a declining income stream, which directly affected the college's ability to fund needed internal changes. This situation presented a dangerous declining spiral of negative entropy in the enrolment system. It meant that a purposeful action had to be taken to address both the internal and external changes.

Responses to the system of enquiry revealed that many fruitful ideas came from the college staff and parents, so enabling a business plan to be established that would produce significant positive outcomes.

Points of Leverage

The key point of leverage here was the experiential learning gained by involving the staff and parents in the enquiring process. It revealed that a high degree of accommodated views were reached to generate constructive ideas for addressing the issues at hand. This consolidation of views and new initiatives has enabled the principal and the board to gain approval from their religious stakeholders for implementing the changes without objection. This had been a time consuming process in the past as the superiors traditionally adopted a very conservative approach to change. They resisted openly marketing the college or promoting the results attained by students. Any decisions concerning change usually took six months to resolve. The consideration of pluralist views and the resultant accommodated position provided the catalyst for an immediate acceptance of change proposals from the board.

Hidden Concerns Raised

Hidden concerns were raised mostly from exit interviews with students and parents. Parents removed their children from the college for a number of reasons, the most common being financial. This occurred as a result of job loss, or frequently as a result of a matrimonial break up, where the party with the higher income no longer accepted responsibility for the education of the child. Other instances were driven by the student who felt isolated in a fragmented family and wanted to be at another school with her friends or at a co-educational school that offered more social life. Less frequent reasons were related to the curriculum where parents wanted other language course such as Italian or Asian languages. The college presently offers German and Indonesian. French and Italian had been offered in the past but had been withdrawn due to lack of interest by senior students in continuing their language studies through to year 12.

The college has responded to the major concern by providing full time pastoral care and psychological counselling for students on a confidential basis.

6.7 Summary

This chapter provides the basis for the data input of the study. Five case studies undertaken in five different industries with differing problems, cultures and worldviews provide a range of examples of the application of soft systems methodology to understanding and learning from a complex pluralist situation. The following chapter proves an analysis of the results of the study.

Chapter 7: Discussion of Results and Analysis

7.1 Introduction

This chapter describes the analysis of the five case studies undertaken in this research. The five cases were chosen as being representative of a diverse range of human activity systems involved in change or potential change. The assumption underlying the study is that these case studies are representative of most situations involving change. Each case is analysed separately with an evaluation of the efficacy of the SSM methodology, an evaluation of the transformation against Checkland's 5 E's. Lessons learnt and points of leverage are identified in each case. The case studies are then compared to the research questions to evaluate the overall response of the research hypotheses.

The performance criteria for using SSM as a research tool is depicted in Table 7.1.

Table 7.1 Evaluation of SSM Tools

SSM Tools	Performance Criteria
Rich Picture	Diagrammatic representation of the complex and messy problem addressed. Structures, relationships, processes and issues including conflicts are illustrated. Roles of people involved are indicated.
Root Definitions	The definition contains only one transformation. They are relevant to the problem situation. The definitions are succinct and follow the form: do A by B to achieve C.
Conceptual Model	Structured activities in the model are necessary to realize the root definition. The description of the activity begins with a verb. The activities form a coherent set. Monitor and control activities are included and reflect the environment E.

The research questions are also re-presented here in Table 7.2 as a guide to examining the responses.

Table 7.2 Research Questions

Questions to be Answered by the Research
1. Can the means of optimising change in organisations be identified and modelled consistently by this research, using a soft systems approach?
2. Will the models developed be applicable across a range of real world organisations and cultures with a diversity of thinking?
3. Can the rate of change in an organisation be leveraged by intervention, when applying leverage points identified in a soft systems approach?
4. What will be the level of influence of existing systems climate and boundaries on the effectiveness of the models in leveraging change?

7.2 Case No.1: Summary of Results

Case No.1 is the study of a municipality undergoing change through amalgamation and the urgent need to maintain works and services operations through competitive tendering.

The following Table 7.3 illustrates the application of SSM where the purposeful activity is expressed as root definitions in the form of CATWOE (Customer, Actors, Transformations, World-view, Owners and Environment).

Table 7.3 Root Definitions – Case No. 1

	Root Definition
C	The customers are the community members served by the municipality.
A	The employees are the actors.
T	Provide works and services that are cost and time competitive with those available from outside providers.
W	Development of business skills and culture can make the transition feasible.
O	The elected or appointed directors of the municipality.
E	The political environment that initiated the change.

From these root definitions, the following elements of the conceptual model were generated as shown in Table 7.4.

Table 7.4 Elements of the Conceptual Model – Case No. 1

Elements of the Conceptual Model
Establish which areas of their activity were in fact under threat from competitors
Identify skills required for tendering
Establish costing metrics
Train staff in the process
Amalgamate and consolidate resources
Define, cost and present services
Achieve an effective business unit
Win tenders, keep jobs and enhance service cost and delivery
Monitor and control the process

The conceptual model is compared to reality as depicted in the rich picture and from that comparison, changes are proposed to achieve the ideal outcomes as discussed in chapter 6.

7.2.1 Evaluation of Methodology

The integrity of the soft systems methodology is evaluated using a review of the SSM tools.

The application of SSM to this case study follows the traditional SSM approach as described in the methodology. It is argued that the application of SSM to this problem is a successful approach as it fulfils the requirements of the SSM performance criteria. However, as a process of enquiry, it had some shortcomings in eliciting responses and views from the blue-collar workers. Their ingrained culture of separation from the management of the process and the past approaches of management, with the division of labour and its resultant exclusion of participation of the workforce in contributing viewpoints and suggestions, created a cultural barrier that was difficult to change. Other participants were able to express their viewpoints freely.

Apart from this constraint, the process was seen as successful, as it delivered agreement on a range of feasible and desirable activities that can be applied to the problem for its resolution.

The transformation **T** is evaluated by considering Checkland's 5 E's

1. Efficacy (will it work)
2. Efficiency (will it work with minimum resources)
3. Effectiveness (does it contribute to the goal of the organisation)
4. Ethics (is it morally sound)
5. Elegance (is it aesthetically pleasing)

The response to the evaluation of the transformation is as follows:

1. The Transformation: *Provide works and services that are cost and time competitive with those available from outside providers*, can be considered efficacious as it necessary for the survival of the organization in its present form. The transformation depends heavily on the resources of a competent leader and manager.
2. The transformation can be considered efficient to the extent that many of the present human resources are retained. Some resources, notably those from other towns, are redundant and are shed. The transformed organization will have up to 25% less labour than its predecessor.
3. The effectiveness of the transformation is measured by its ability to achieve the goals of the transformation, namely to continue to provide works and services but at time and costs commensurate with competitive providers.
4. The transformation process does not present a moral conflict, however, in terms of social justice, there are two views to be considered. The economics view is that the transformation will make better use of resources and money. The social view is that there will be fewer jobs for people in the local communities and that all the jobs in the municipality will be located in one major centre, rather than distributed across the region.
5. The elegance of the transformation is in its display of achievement of its goals and the atmosphere of progress associated with innovation and cooperation.

Consequently, it is argued that the transformation in Case No.1 was successfully presented.

7.2.2 Analysis of the Outcomes of the Research Questions

Response to the Research Questions:

1. In order to make sense of the responses to the interview questions and to make useable the interview material, the application of the data to a conceptual model of the ideal situation provides a means of identifying pathways to a solution to the expressed problem. By following the SSM methodology of defining and establishing root definitions of the required transformation, the process can be expressed as a conceptual model. The optimisation of the process relies on the worldview of the controlling owner of the process, in this case the directors of the municipality. Here the process was optimised by the application of SSM groups to identify feasible and desirable change that allowed the CEO freedom to proceed with the change program.
2. The suitability of the model to this application is interesting. The change process is heavily oriented towards coercive change, as it has been thrust upon the municipality by the state government, without recourse to exception or dilution of the government's requirements. As discussed earlier in the literature review, the application of SSM as described by Flood and Jackson (1991) is defined as one where the problem is complex and the views are pluralist. This is certainly the case here, however, they further postulate that no systems methodology is currently based on the assumptions that a problem is both complex and coercive. Their argument is based on concerns that the true sources of power are hidden. In this case the source of power is clearly the directors of the municipality in setting the agenda for change. However, it is argued that the means and pathway to the end result is still very much divergent and pluralist, and so the application of SSM in this case includes elements of the complex-pluralist relationship.
3. The change drivers in the case study were the government policy requiring an immediate start on the tendering process and the need to be successful at the process. The leverage points that arose from these imposed criteria were the rapid learning required to achieve the objective. The points of high yield

learning were identified as: process mapping, cost probity, teamwork and the engagement of managers skilled in the process. All these points were raised in the SSM groups. A further point of leverage was the learning required to win the hearts and minds of the employees. This was learning on the part of the CEO and was achieved by strong leadership in the form of a clearly articulated direction, genuine and unflagging support for the employees and the maintenance of an ebullient positive attitude. Consequently, it is argued that the rate of change in the organization can be leveraged by intervention using the points of leverage identified by the SSM process.

4. In this case, the boundary of the system was changed to incorporate what had been two municipalities. The new system has to rationalise resources and remove those that are redundant. This has created significant emotional resistance that requires attention to reach a consensus. This factor may have a negative influence on the outcome, as there are likely to be losers among those who reject the amalgamation. The key stakeholders outside the boundary of the model are: the government, the community of the municipality and the contractors who exert competitive pressure on the tendering process. Some are large contractors with significant resources and highly refined business processes. All of these influence the existing system and may affect its efficacy. The government sets the end objectives and time lines. In this case they are predetermined and no immediate change is likely. The community exert pressure for services or the reinstatement of lost services. Regardless of the outcome of their concerns, time and energy is consumed in dealing with the issues raised. This concern was addressed by the SSM group with a proposed public relations campaign to inform the community of the change process. The contractors are ever present and are encouraged by the opportunity to win business in a previously closed sector. By winning tenders, the municipality was able to counter this threat. The level of influence of outside pressures is significant and is a critical factor to be considered if time delays and loss of confidence in the process are to be avoided.

7.3 Case No. 2 Summary of Results

Case No.2 is the change in workplace culture as part of award restructuring, to facilitate a more competitive and sustainable manufacturing economy.

The following Table 7.5 illustrates the purposeful activity of change expressed in the CATWOE format.

Table 7.5 Root Definitions – Case No. 2

	Root Definition
C	The customers are the owners and investors.
A	The employees are the actors.
T	Change the workplace culture from a mechanistic culture to a productive oriented culture.
W	Attain a workplace cultural change as a means of achieving and sustaining viability in the world market.
O	The owners are the industrial parties.
E	The environment is one of uncertainty and distrust.

From the above root definitions, the following elements of the conceptual model were developed as shown in Table 7.6.

Table 7.6 Elements of the Conceptual Model – Case No. 2

Elements of the Conceptual Model
Review Australia’s competitive position with government, employers and unions.
Formulate and launch policy of industry award restructuring.
Fund policy delivery to industry with government contributes of \$12 million.
Train facilitators to interpret policy to industry.
Deliver industry training sessions.
Establish enterprise consultative committees.
Audit skills and reclassify workers to new awards.
Develop productive and flexible workforce.
Revise trade skills and trade training to reflect new competencies required.
Monitor and control the process.

7.3.1 Evaluation of Methodology – Case No. 2

In Case 2, the rich picture, the root definitions and the conceptual models all satisfy the performance criteria. As a process of enquiry, the study generated a healthy flow of ideas and suggestions from the workforce. This was attributed to the presence of the unions in the change process and the confidence held in their role of upholding the interests of the workforce. The majority of skilled workers could also see a pay benefit in improving their skill levels and this was a catalyst for open discussion and active enquiry. Limited input was received from semi-skilled or process workers.

The SSM process is seen as successfully delivering a range of feasible and desirable activities that can be applied to the problem situation.

The response to the evaluation of the transformation by considering Checkland's 5 E's is as follows:

1. The Transformation: *Change the workplace culture from a mechanistic culture to a productive oriented culture*, can be considered efficacious if it is adopted and implemented by the two key powerful parties involved in the change process, namely the employers and the unions. The two hidden constraints raised by the study were the employers' uncertainty of the nexus between increased skill level and increased productivity, and the union officials' desire to retain the old power plays of confrontational tactics.
2. The efficiency of the process is relatively low, as it will consume considerable resources of time and money. The process of reclassification of awards across a range of industries, the training and reskilling of workers to match the new awards, together with the communication of the change process to both employers and workers is estimated to take 24 months. The government has budgeted up to \$12 million for training and consultancy services.
3. The effectiveness of the transformation, measured against the previous arrangement, can be considered as fully effective as it will contribute to the

goals of the organization to remain competitive. Another alternative is the complete dismantling, or scrapping, of the award system. This alternative could result in the loss of the benchmarks and safety nets built into the awards. It would be seen as the result of a political agenda rather than a move to increased competitiveness and productivity.

4. The transformation does not present a moral conflict. In fact it has the advantage of adjusting wages across various industries to a more equitable scale, based on equivalent skill levels.
5. The elegance of the transformation is in its move from work structures developed after the industrial revolution to structures focused on operating in the modern world.

Consequently, it is argued that the transformation in Case No. 2 was successfully presented.

7.3.2 Analysis of the Outcomes of the Research Questions

Response to the Research Questions:

1. The SSM methodology of root definition and conceptual model provided clear identification of the characteristics of the transformation and the pathways to achieving its implementation. The training and information sessions on awards restructuring and the SSM focus groups generated a copious number of questions on the introduction of the changes, which added to the field of enquiry. Various concerns and constraints raised were addressed by the SSM groups, so optimising the process of change. One specific example was that of a fitter working with hydraulics. This area of work requires a higher level of skill and knowledge than is normally received in trade training. The SSM group was able to assure the fitter that having received the necessary training and attaining the required competency, a higher level of classification and pay scale would be forthcoming. By addressing issues such as this in the SSM

groups, many of the concerns that formed barriers to accepting the changes were alleviated, so allowing the changes to proceed.

2. The participants in this case represent a very divergent group of thinking in both the need for change and the respective benefits. They also form very diverse sub-cultures in the same industry. The application is pluralist both in viewpoints and volume, and is complex in the range of variables addressed indicating that the SSM model as applicable to this situation. Although changes to the awards paradigm was not considered to be coercive, considerable pressure was exerted by the senior members of the industrial parties to move forward with the restructure.
3. The leverage points identified in this case were: the learning process by the participants of the reclassification levels; the required skills; and the associated pay levels. A range of fears and concerns were alleviated and the process was able to continue without disruption from those concerns, however, not all workers' concerns were addressed by the SSM groups. Those that were addressed were considered to have reached a satisfactory accommodation. Other factors outside the scope of the study also influenced the speed of the change and resulted in a drawn out process. Also learnt was the need to develop separate models for the less structured industries, to avoid the delay of waiting for the larger industry changes to be enacted and the learning from the employees' viewpoints of the benefits of progressive skill growth and associated compensation. The former allowed the process to be introduced simultaneously in other industries, rather than waiting to see the effects in the metals industry, as was originally intended. The latter provided a uniting thread for workers in their desire to improve themselves. With union sanction and support they formed a change lever for the implementation of award restructuring.
4. Although there were no overt objections to the change process from the leadership groups, there was identified reluctance, particularly on the part of some union representatives to move away from the confrontational system as they saw a more cooperative approach as a diminution of their power base.

This attitude proved too deeply ingrained in some and required intervention from senior union leaders to prevent an adverse effect on the progress of change in this case. Their attitude was one of the delaying elements in the change process.

7.4 Case No. 3 Summary of Results

Case No. 3 is the change required by a heavy machinery dealer to bring their business performance up to the benchmark set by the manufacturer and achieved by other dealers in their industry.

The following Table 7.7 illustrates the purposeful activity of change expressed in the CATWOE format.

Table 7.7 Root Definitions – Case No. 3

	Root Definition
C	The customers are the owners of the business.
A	The actors are the directors, management and all responsible employees.
T	Bring the organisation's performance up to the worldwide standard of other dealers.
W	Work to achieve a standard of business performance compatible with other dealers worldwide.
O	The manufacturer is the Owner of the system.
E	An environment of diminished levels of achievement.

From the above root definitions, the following elements of the conceptual model were developed as shown in Table 7.8.

Table 7.8 Elements of the Conceptual Model – Case No. 3

Elements of the Conceptual Model
Identify leadership and management deficiencies.
Identify staff and facility deficiencies.
Recruit or appoint suitable candidates.
Develop a competitive business plan.
Set benchmarks for performance.
Train competent staff.
Measure performance.
Monitor and control the process.

7.4.1 Evaluation of Methodology – Case No. 3

In Case No. 3, the rich picture, the root definitions and the conceptual models all satisfy the performance criteria. As a process of enquiry, the interviews with operational staff were not very fruitful in generating ideas for reform. This probably reflected the lack of challenge and experience at higher levels of performance. Interviews and SSM groups with management staff, other than family members, were more productive. Interviews with family members were more constrained. They reflected a satisfaction with the status quo and an underlying resentment of perceived pressure by the manufacturer to change or be replaced.

The response to the evaluation of the transformation is by considering Checkland's 5 E's as follows:

1. The Transformation: *Bring the organisation's performance up to the worldwide standard of other dealers* can be considered efficacious, as the benchmark of average dealer performance is achieved by many other dealers with more difficult market conditions. The demise of this business had resulted from a lack of leadership, good business management and indifference due to their past dominance of the market. Both sales and customer service quality had declined steadily during the period of the present administration.
2. The resources of the staff and facilities presented good potential for training and developing. With a change in management and a more aggressive business plan addressing all business areas, the organization should be capable of increasing its productivity substantially. The transformation is considered efficient.
3. The effectiveness of the transformation is critical to the future of this organization as a dealer of the manufacturer. In this sense it will contribute fully to the achievement of the organization's goal to remain a viable dealer of

this manufacturer. The manufacturer's attention has been focused on turning the dealer's business around or finding an alternative dealer.

4. The transformation does not present any moral conflict. The terms of the agreement between the dealer and manufacturer spell out the responsibilities of each party and there are no surprises. The transformation is ethically sound.
5. The transformation is quite elegant, as it will re-establish this family company as a reliable and well functioning dealer. It will provide a business platform for the next generation of the owning family and will continue the role and tradition it has held for 50 years.

Consequently, it is argued that the transformation in Case No. 3 was successfully presented.

7.4.2 Analysis of the Outcomes of the Research Questions

Response to the Research Questions:

1. The SSM approach proved very fruitful in identifying various means for improvement. Interviews with participants revealed an extensive list of options for changes in process. Many questions as to why things were processed the way they were, revealed shortcomings in the process and were often followed with suggestions for improvement. Many perceived constraints were found to be baseless, opening the way for suggestions for improvement. In some cases, poor performance against benchmarks was due to structural constraints that could be addressed by management.
2. This case addressed management issues in a large company with international suppliers and serving a national market. Their diverse culture is typical of most large business organizations as it incorporates a full range of employees from senior management to labourer. It is made complex by the nature of the

family ownership structure and the varying extent of their power and influence within the company.

3. There were several learning experiences gained through the SSM experience that produced leverage for change. The points of leverage identified in this case was initially the learning experienced by the CEO in comprehending his role in relationship selling. Also significant was the turnaround in sales achieved by identifying and accepting deficiencies in capability by the sales force. The subsequent training was more effective as they now had a more motivated attitude to improving their skills. The training incorporated team learning and delivered a more skilful and professional team. Similarly the service management team recognised shortcomings in their administrative practices. The learning gained allowed them to proceed with increased confidence in administering their warranty claims. Although a number of change areas were addressed, these three were the areas of worst performance and offered the most significant improvement. The accommodation reached on group and individual deficiencies provided the catalyst for accelerated change in these areas.

4. The dealer was located in a pleasant city, but remote from the main centre of business activity. As the family had other diverse financial interests in the same home city as their dealership, they were firmly opposed to moving the centre of their operations to the major business areas in another city. This formed a constraint outside of the boundary of system under study, which affected exposure and communication. Another constraint was the size of their business territory, which was capped, and consequently was subject to the fluctuations of the local economy.

7.5 Case No. 4 Summary of Results

Case No. 4 is the study of an industrial clothing manufacturer with a messy logistics problem in their storage and distribution areas.

The following Table 7.9 illustrates the purposeful activity of change expressed in the CATWOE format.

Table 7.9 Root Definitions – Case No. 4

	Root Definition
C	The customers of the transformation are the company owners and managers.
A	The actors are the company managers and those employees involved in the proposed process change.
T	Provide an efficient and effective inventory management system, in particular the storage and distribution elements.
W	A warehousing function capable of handling the quantity and range of products produced and distributed.
O	The owner is the chief executive of the company.
E	The physical constraints of the business premises.

From the above root definitions, the following elements of the conceptual model were developed as shown in Table 7.10.

Table 7.10 Elements of the Conceptual Model – Case No. 4

Conceptual Model Elements
Identify Storage Capacity Required for: <ol style="list-style-type: none">1. Regular Orders2. Seasonal and Bulk Orders
Plan Storage Space for: <ol style="list-style-type: none">1. New Material2. Finished Product3. Work in Process4. Hanging Garments
Plan Space for Order Picking, Consolidation and Packing
Plan Distribution Channels: <ol style="list-style-type: none">1. Distribution Centre2. Direct Customers3. Export Orders
Plan Order Entry Model: <ol style="list-style-type: none">1. On line Orders2. Manual Orders, Phone, Email etc.
Provide Customer Feedback Channel
Monitor and Control

7.5.1 Evaluation of Methodology – Case No. 4

In Case No. 4, the rich picture, the root definitions and the conceptual models all satisfy the performance criteria. As a process of enquiry, the study produced an unusual set of ideas and suggestions. It was unusual in that very little information was forthcoming from the management team. The employees, who were mostly process workers employed in cutting, sewing, pressing, picking or packing expressed their comments in terms of constraints such as ‘we can’t do this because...’ or ‘we have to do it this way’. The researcher then reverted to asking more ‘why’ questions rather than ‘what’ questions. Although many were not informed as to the business reason for some processes, they had drawn general conclusions and were certainly able to explain the benefits of alternate processes. These responses were very useful to the process of enquiry and enabled alternatives to be explored..

This and other similar situations revealed during the study contributed to the rich picture of the complexity and messiness of the unstructured problem.

The response to the evaluation of the transformation by considering

Checkland's 5 E's is as follows:

1. The Transformation: *Provide an efficient and effective inventory management system, in particular the storage and distribution elements*, can be considered efficacious as it is a critical element in the generation of profit for the manufacturer. Studies of other international clothing manufacturers such as Benetton (Dapiran 1992) and local department stores such as Myer and David Jones (Morgan 1995) indicate that storage, retrieval and distribution systems provide the competitive edge that keep them viable and has enabled them to be market leaders in their field.
2. The transformation can be considered efficient, as it will eliminate many of the ineffectual or inefficient practices exposed by the study. For example, management had introduced piecework to speed up production in the pressing area. Workers receive a bonus based on the number of items processed that exceed a standard benchmark. This certainly increased production, however, the increased volumes were stored for days on trolleys awaiting placement in their location and were not available for sale until located correctly.
3. As storage, retrieval and distribution are essential elements of the business process, an improvement, particularly a quantum improvement, will contribute to the goal of the organization and hence will improve effectiveness.
4. The transformation does not present a moral conflict. On the contrary, better use of the company's resources will reduce waste and help maintain an economically viable business that employs hundreds of people.
5. The present storage facilities are rather tired and disjointed. This transformation will improve both the functional characteristics of the business and its general appearance. The ability to take pride in showing business and community visitors to a manufacturing site is rewarding for both the management and employees. The transformation is considered elegant.

Consequently, it is argued that the transformation in Case No. 4 was successfully presented.

7.5.2 Analysis of the Outcomes of the Research Questions

Response to the Research Questions:

1. The means of optimising the process using SSM identified in this case was by applying process mapping and by finding the optimum pathway for each process. Interviews with participants revealed a number of faults in the system as described earlier. The SSM approach helped to identify these constraints and to elicit responses that indicated the value or otherwise of the procedures as they stood. This then opened the way for alternative approaches that could provide better outcomes or eliminate the problem entirely. The changes required were both structural and procedural. Although the initial rate of engagement in discussion was low and the presence of the researcher was the cause of some concern and suspicion on the part of the union representative, it did drive discussion and raise a number of alternative concepts that were of value in resolving the unstructured problem. Accommodation was reached on a number of options that were acceptable to the workers, the union and the management. Consequently it can be concluded that the SSM methodology applied can be a means of optimising the change process.
2. The model developed for this organization was consistent with the technological constraints imposed by the owners. The owners were cognisant of the highly mechanised logistics systems employed by large international clothing manufacturers, however their objective here was to resolve some of the existing problems without a complete re-engineering of their operation. The model proved to be consistent with their real world situation and the limit of their thinking.

3. The points of leverage identified in this case were focused on the need to refine their storage, retrieval and distribution system to provide a more competitive business platform, in light of the intense competition from overseas and to improve customer service levels of distribution to avoid lost sales. The initiative for change rested with the management group. The divergence of viewpoints was mainly the management's concern with the operation of the system and the worker's concern with being treated as a pawn. By communicating the potential improvements to the viability of the business to the employees in non-threatening SSM forums, the company was able to solicit ideas from the workforce. The opportunity to critique the management proposals and to air grievances at the same time, contributed strongly to building acceptance for new procedures and changed working conditions. The SSM process delivered an accommodation of views on introducing changes and reduced the perception that initiatives for change came exclusively from management. With agreements in place, the changes were able to proceed without delay. The enquiring processes of the study heighten expectations that changes were imminent and in turn facilitated the change process.

4. The nature of this workforce was one of limited education with a culture of process work, where work operations were costed by the minute. This resulted in a diminished pool of ideas and initiatives for improvement. The workforce was more intent on airing grievances than on offering improvement, although the level of resistance to change was considered to be low compared to other studies conducted by the researcher. The management ideas were also somewhat confined to orthodox thinking and heavily influenced by their own longstanding methods of production. The opportunity to extend the system boundary by importing finished product from China had been tested and proved successful. With this in mind, management's time and energy was heavily devoted to the alternatives for future production. Notwithstanding this issue, the activity of the study served to re-emphasise to management the strategic importance of the logistics operation, regardless of the source of manufacture.

7.6 Case No. 5 Summary of Results

Case No.5 is the study of the enrolment process at a girls' secondary college and the subsequent need to change class sizes and curriculum to meet customer expectations.

The following Table 7.11 illustrates the purposeful activity of change expressed in the CATWOE format.

Table 7.11 Root Definitions – Case No. 5

	Root Definition
C	The Customers are the parents or their representatives.
A	The college board, the principal and the senior staff.
T	Move to six streams of students with class sizes of no more than twenty-five.
W	Maintain the educational, social and economic position of the college by moving to six streams of twenty-five students.
O	The owners are the board and principal of the college with some influence from other stakeholders.
E	An environment of uncertainty and declining enrolment base.

From the above root definitions, the following elements of the conceptual model were developed as shown in Table 7.12.

Table 7.12 Elements of the Conceptual Model – Case No. 5

Elements of the Conceptual Model
Define potential capacity of college.
Identify facility resources or shortcomings.
Identify potential feeder sources.
Identify what parents want.
Identify what students want.
Identify what job-ready skills the community wants.
Identify potential transport options and providers.
Market and promote the college's strengths to the community.
Monitor and control.

7.6.1 Evaluation Methodology – Case No. 5

The rich picture shows an educational institution with a traditional past, owned and operated by a religious order, facing a declining enrolment base, changing social norms and a range of issues and concerns that affect both the viability of the college and the way it conducts its educational process. The relationships, conflicts and concerns along with the roles of people are illustrated in the rich picture of the expressed problem.

The root definitions succinctly define the transformation and the conceptual model describes a coherent set of steps to achieving the transformation.

The response to the evaluation of the transformation by considering Checkland's 5 E's is as follows:

1. The Transformation: *Enrol six streams of students with class sizes of no more than 25*, can be considered efficacious as it will be achievable if students can be recruited from a wider area. Twenty-five is the normal desirable class size for a college of this type. Based on the initiatives brought forward during the SSM groups, a wider recruitment zone along with marketing of the college's strengths is expected to result in increased enrolments.
2. Some additional resources in terms of teaching and administrative staff will be required, however, they can be funded by the additional revenue generated by the additional numbers. No additional physical resources will be required. Consequently, the transformation is considered efficient.
3. The transformation will contribute markedly to the viability of the college and consequently will enhance the goal of the college. The transformation is considered effective.
4. There are no moral conflicts in the transformation. The transformation will result in an increase in employment at the college and the associated transport providers. The transformation is ethically sound.

5. The transformation is elegant, as it will enhance the viable operation of a well-established college with a strong reputation for academic and societal success.

Consequently, it is argued that the transformation in Case No. 5 was successfully presented.

7.6.2 Analysis of the Outcomes of the Research Questions

Response to the Research Questions:

1. The means of optimising change was enhanced by the input from staff as they discussed the topic. Their knowledge of student and parent requirements (and demands) was extensive and although many staff views were focused on their own areas of concern, the discussion generated significant learning of the difficulties faced by the college management in accommodating the broad range of diverse requests. The discussions further provided new ideas and initiatives and also identified potential constraints that could restrict or deny the proposed ideas. This process gave the principal a more informed knowledge of the changes that could be implemented readily. Those changes that required more explanation or persuasion were also highlighted and broad explanations were developed. The accommodation reached from the learning process of the SSM methodology allowed the rapid progress of the changes proposed.
2. The general culture of the college was that of an educational institution, however, the culture of the student body, and their parents was becoming more diverse each year. Although the college is a denominational school founded by a religious order, the student body was from mixed faiths and cultures, including some with no professed religion. The diversity of the enrolled students represented the diversity of the district with many migrant families of varying cultures. Applying the methodology to an educational organization at secondary or high school level, as distinct from a business organization, was successful and indicated the versatility and utility of the methodology.

3. The rate of change in an organization can be optimised or leveraged when the divergent or contrasting views can be accommodated and a congruent set of values can be found. In this case, the SSM methodology was successful in identifying values shared by both parents and staff. These accommodated beliefs, ideas and values were instrumental in optimising change. Previously, attempts to accommodate the views of all the stakeholders from the students to the religious authorities had resulted in long delays and frustration.

4. The college has a strong ethos that identifies its spiritual character. It forms part of the system climate in which the college operates and distinguishes it from other schools. As this is an essential part of the nature of the college, any changes must fit within this paradigm. For example, the college gives enrolment preference to students from denominational primary schools, existing siblings, daughters of past students and daughters of staff members. Once these have been satisfied, then recruitment from elsewhere can proceed. The college has also to be mindful of the views of the religious community, which is outside the immediate boundary of the college, but is an important stakeholder.

7.7 Summary of Key Findings

7.7.1 Methodology

The criteria for using SSM as a methodology was satisfied in the three areas of rich picture, root definitions and conceptual model. By following the seven-stage version of the methodology, an explicit pathway is provided which affords significant rigour to the methodology. Comparison of the conceptual model with the real world was provided so that the learning cycle of evaluating viable and desirable options could be implemented. Although the implementation phase was not part of this study, implementation has subsequently been successfully carried out in each case.

7.7.2 Transformation

The root definitions in the five case studies generated valid conceptual transformations that satisfied the change objectives of each case.

7.7.3 Identification of Change Optimised by Points of Leverage

Case No. 1

Although there was no previous benchmark for amalgamation of municipalities, the change process could be benchmarked against other regions going through the same process at the same time. The municipality under study was the only one applying SSM to the change process. In this case the newly formed larger municipality was established and operating within 30 days of the start of proceedings. They had tendered for services and won within six weeks of the start date. The entire transformation was completed within three months. This municipality was the first to complete the process and was markedly ahead of all others. Some took up to twenty-four months to resolve resistance and to achieve targets. The learning experienced by both the management and employees, created by the SSM process, engendered true accommodation of a range of views that resulted in a significant acceleration of the change process.

Case No. 2

The experiential learning gained by discussions in the SSM groups between managers and skilled workers about the relativity of skill levels and pay levels provided the basis for agreements on how to proceed with the changes to the award system. The employers and the skilled workers then discussed the identification of levels of deployment of these skills. These discussions developed a consensus of views on the change process that enabled the leveraging of its introduction. Although in this case there was minimal acceleration of the change process, there was also minimal delay due to divergence of values. Also, the SSM process suffered from the inability of the research to include the viewpoints of the majority of lower skilled or process workers. The time taken for the transformation was twelve months in the metals industry and up to twenty-four months in other industries. The SSM process itself was quite successful, however delays outside the boundary of the system, in particular the rewriting of the awards and the benchmarking of the process by other industry restructuring bodies, resulted in a the change process being extended to twelve months.

Case No. 3

By bringing junior members of the family together with senior management and the manufacturer in the initial round of SSM groups, a foundation consensus was obtained on the need to change and on the likely way forward. Further discussions were then held which included the senior members, where the manufacturer's views were expressed in a non-threatening manner. Significant emphasis was placed on the desire to improve the situation rather than change the dealership. Over a period of three weeks, a consensus was achieved on the changes considered necessary and an action plan developed. Considering that this problem had been festering for four years and that several calls for change by the manufacturer had been met with disdain, the accelerated change introduced by the SSM process is considered a success. The new sales manager introduced a similar process to the sales force. The learning experience on the part of the sales representatives was the turning point in the sales performance of the company. The exchange of views introduced by the new sales manager highlighted the weaknesses in their abilities and encouraged discussion on how they might develop their skills to make the critical change in performance. This exchange

of views provided the leverage needed to the change process to be optimised at both senior management and sales levels in this company.

Case No. 4

The change leverage obtained in this case resulted from the accommodation of divergent views expressed by the management and staff about the existing manufacturing, storage and distribution processes. Alternatives were considered and employees contributed ideas and highlighted constraints of which they were aware. The way forward adopted by the company was based on the consensus of views established through the learning achieved in the SSM groups. Many potential constraints, which had been raised in the past, were discussed and agreement reached on understanding and considering their significance. The CEO reported that an extensive change of this nature had not been attempted in the past due to the level of objections from management and unions and the potential delay to production and delivery. The SSM process enabled a new accommodation of views to be reached, where parties with divergent views had been included in the discussion, so facilitating the change process. The entire change process including the construction of a mezzanine floor and extra door was completed in three months. This rate of change would not have been achieved without the accommodation reached through the SSM process.

Case No. 5

The learning obtained by bringing together the principal, the staff and the parents in SSM groups resulted in a consensus of views that enabled the principal and board to adopt a workable plan for the enhancement of enrolments at the college. Further leverage for change was achieved by the inclusion of representatives of the religious order in subsequent SSM groups. The process of enrolment is time sensitive, with enrolments for the following year being finalised by May of the current year. The SSM process was commenced in February and conducted over a period of four weeks. Action plans were developed and instituted throughout March and April of the same year. The accelerated change achieved through the SSM process enabled the enrolments to be boosted to the proposed level by May.

Chapter 8: Conclusions

8.1 Introduction

The research considers five case studies from diverse industries, all facing problems that require extensive organisational change. In some cases the change is coercive change. Soft systems methodology is applied to each problem to generate an outcome based on the learning experiences of the participants. These learning experiences are described as change levers, as they have considered the elements of the problems in light of the various worldviews of the participants and offer a pathway forward, acceptable to all participants and relatively free of resistance. Mutually acceptable solutions proposed have been structured into conceptual models for comparison to the real world and eventual viable implementation.

8.2 Conclusions

As a result of the research applied in this study, all the objectives stated in chapter one have been achieved. Consequently, it is argued that the rate of change can be enhanced by the application of the SSM process.

The conclusions of the study are presented as follows:

1. Four of the five case studies illustrated an enhanced rate of change. Case study No. 2, sited in a very large organization of 2000 employees, did not achieve any significant rate enhancement, although the SSM process was successful as a learning process. Change rate enhancement in this case was inhibited by the inability to engage with all employees. Also, some of the change process, namely the rewriting of the awards, was external to the boundary of the system and was extended over a twelve-month period.
2. Enhancement was achieved by the cyclic learning process of comparing the ideal concepts with reality in a non-threatening environment, where concerns can be expressed and participants can see a pathway to change. Learning in

this environment promotes understanding and acceptance. As the process is participatory it encourages action, which in turn enhances the rate of change. Participants build up an understanding of the change process that enables the owners to attain full support for the change process.

3. The validity of the process is enhanced by the inherent qualities of the SSM process of learning, understanding and accommodation. The cyclic nature of the learning process raises biases that are expressed and considered and eventually dispelled. It also affects a reduction in erroneous assumptions and misplaced concerns. Valid concerns can be expressed in the rich picture and addressed by the SSM process.
4. The process can be applied to a wide range of organisations; however, the study found it was most effective where the majority of participants who could influence the outcome, could be engaged in the process. In this case it was organisations with around 100 employees.

8.3 Contribution to Learning

Although the literature offers a range of applications for the extended use of soft systems methodology, there is little evidence recorded of its use in enhancing the rate of change in organizations. This research offers five case studies where the SSM process is applied to organisational change. The research showed that where employees and other stakeholders, who can influence the outcome of change, can be engaged in the SSM process, building an accommodation of views and an understanding of the change process could enhance the rate of change. This produced new knowledge on the application of soft systems methodology. The research also identified the generation of creativity and innovation with the application of the process. This supports the research of Molineux and Haslett (2007) on the extended application of the SSM process in the area of creativity.

8.4 Limitations and Constraints

Conduct of the case studies revealed that the process of discussion and debate was more easily managed with smaller numbers of people. In case No. 2, one of organisation's sites included in the study had around 2000 employees. This was managed using focus groups to gain a representative cross section of the employees. However, some individuals thought they were being excluded and others wanted to know what changes were recommended or promoted. They found it difficult to appreciate that the initial process was a learning process focused on raising concerns and differing viewpoints. Dealing with a large organization was found to be a constraint in this case. In comparison the other case studies where employees numbered around 100, the ability to accelerate change in this very large organization of 2000 employees, at three separate locations, was limited. In addition, the process of rewriting the awards was very time consuming and this necessarily constrained the change process. Consequently, the research identifies limitation of the application of the process to organizations of around 100 employees.

In dealing with matters of power and politics as in case number one, where the change driver was a coercive directive from the government, the process seemed relatively conservative, as it could not address the issues imposed on the municipality, but rather addressed the means of managing them and the procedure for implementing them. However, these elements of power are present in the rich picture and are considered in developing the rich picture, so the application of the methodology remains valid.

The iterative process may take considerable time to reach a consensus as was found in case number five. Many of the participants were parents and people external to the college and were available only on a part time basis. This necessarily extended the process and delayed the concept of accelerated change. However, once accommodation had been reached, change proceeded in an advanced manner.

8.5 Practical Implications

For an organization to implement radical change to their system of management, patterns of thought must be changed. Drivers of change are frequently external to the organisation's system and consequently are beyond the control of the organization. Change in these cases is imperative and often immediate. To implement change in a timely manner without significant resistance or constraint from the participants, management has to enact both a logical and emotional change with the participants.

Soft system methodology has proved to be a powerful tool in bringing the hearts and minds of the participants together to form an accommodation of views that can then be harnessed to generate a conceptual model of the future. This tool for changing the patterns of thought to deliver a congruent or acceptable view of the future allows the organization to proceed with the support of the participants. This research has shown that the SSM process is very flexible and can be applied to a vast number of different organizations. The hidden benefits of the approach can be creative solutions not previously considered.

A manager's view of the future needs to be clear and well articulated to provide good leadership, however, the way forward may be diverse or unknown. The utilisation of SSM can provide a unique level of engagement with participants, which can expedite the change process, stimulate creativity and encourage innovation.

8.6 Opportunities for Further Research

The system of systems matrix developed by Flood and Jackson (1991) argues that complex-pluralist situations are best dealt with using soft systems methodology. They consider the complex-coercive contexts as situations where the true source of power is either hidden or not apparent. They use the prison metaphor to characterise this situation and argue that as yet there are no system tools to tackle this type of context in the real world.

This research has found that elements of coercive power exist in four of the five case studies, varying from explicit to implied directions. Case four covering the logistics changes was not considered coercive. The researcher's experience in other areas of change management suggest that elements of coercion exist in most real life situations where it is necessary to reach a compromise or trade off before an accommodation can be reached.

Other than the relatively few situations where no agreement can be reached, varying elements of coercion exist in most change situations and could be accommodated in a systems methodology. The researcher suggests there is an opportunity to examine the complex-coercive context further to see if it can be structured into a systems methodology.

The methodology was applied and worked successfully in the chosen industry sites that represent western culture. It is not known if the methodology would be as successful in cultures where participants are more reserved in expressing opinions or in taking an active part in the change process. An opportunity exists to examine this area with further research.

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APPENDIX A

Business Plan for Machinery Dealership Case Three

The following chart illustrates the areas of business that need to be addressed by a machinery dealer to achieve a satisfactory business outcome

Dealer Principal who is Principal Investor and Chief Executive Officer		
SALES DEPARTMENT	SERVICE DEPARTMENT	PARTS DEPARTMENT
Sales Inventory	Repair function	Parts Inventory
Market analysis	Workshop Facilities	Inventory Policy
Sales Staff	Tools Inventory	Inventory Location
Sales Training	Technical Staff	Emergency Supply Policy
Relationship Selling	Technical Staff Training	Inventory Management
Performance Selling	Job Control System	Exchange Program
Financial Selling	Support Programs	Materials Handling
Owning Costs Selling	Support Staff	Order Management Staff
Used Equipment Selling		
Key Performance Targets		
Market Share	Repair Times	Availability ex Stock
Lost Sales	Training Time	Availability ex Factory
Cost of Sales	Warranty Costs	Inventory Turn Over
Gross Profit Sales	Gross Profit Service	Gross Profit Parts

APPENDIX B

Background to the Systems Thinking Paradigm

System concepts

Anderson and Johnson (Anderson and Johnson 1997) describe a system as a group of interacting, interrelated, or interdependent components that form a complex and unified whole. Similarly, Kast and Rosenzweig (1985) define a system as ‘an organised or complex whole: an assemblage or combination of things or parts forming a complex or unitary whole’. O’Connor and McDermot (1997) say that ‘A system is an entity that maintains its existence and functions as a whole through the interaction

of its parts' Tyson (1998) provides a somewhat more succinct definition where he states that 'A system is a set of elements that are actively inter-related and operate interdependently as a total entity'. The set consists of all those parts that the observer decides are in or part of the system and everything else being part of the system's environment. The system boundary is an imaginary line around the systems that distinguishes it from its environment. Boundaries that allow relatively little or no exchange of energy or matter to cross between the system and its environment, define a relatively closed system. Conversely, boundaries that do permit such exchanges to occur define an open system. The environment itself may be a larger system of which the system under consideration may be a sub-system. This arrangement introduces the concept of a hierarchy of systems.

A system's components can be physical objects that you can touch, such as the components of a machine, or they may be intangible objects such as processes, relationships, company policies, information flow, interpersonal interactions and states of mind, such as feelings, beliefs and values. The key factor is that there are connections between the parts in order that they interact. The human body is often used as an analogy of a system and particularly as a system of systems, with its circulatory system, nervous system, digestive systems and so on, each made up of identifiable elements but all interacting and interdependent on each other to a more or less degree. Systems usually interact with other systems in their environment. They may be human systems, natural systems or man-made machine systems. Organisations behaving as systems react with similar systems such as other organisations, or with larger systems such as the economy or the environment.

Tyson's work, however, does not consider the influence of a hostile element on the behaviour of the system, nor does it consider the effects of the external physical environment, such as temperature or space, on the behaviour of human activity systems.

Paul (1997) provides a total of fourteen different definitions of systems, each with different terminology and different levels of detail in their descriptions. However, throughout these definitions some basic elements persist. The concept of wholeness was identified in several definitions in terms, for example: organised, structured,

integrated, working together and collective response. The concept of systems being formed from components was apparent in most definitions, through terms like: prime mission equipment, parts, objects, sub-systems, elements and functional units. One definition makes the point that the components are not restricted to physical entities. The notion of interdependence among these components was expressed in several definitions, in terms such as: interactions, relationships, interrelationships, sequence and logistics. Similarly, the concept of purpose was recognised in most definitions, in terms like: function, needs, goals, objectives, demands and desired results. They also state that components may be man made or natural.

The Pioneers of the General Systems Theory

The 1940s saw the beginning of various disciplines such as general systems theory, systems engineering and systems analysis. These disciplines have common systemic concepts although they often take on slightly different meanings. An early pioneer in this field was biologist Ludwig von Bertalanffy, one of the founders of a multidisciplinary group called the Society of General Systems Research (von Bertalanffy 1972). By 1947, von Bertalanffy had postulated a new discipline called *General Systems Theory*. His theory incorporated ideas of wholeness and homology. One of the system characteristics he defined was system openness, ie, the degree to which a system interacts with its environment, either receiving things or providing things to its environment. Another concept in understanding systems is the idea of a system boundary. In order to consider a system and its associated sub-systems, we need to identify the system boundary. According to Weeks (1991), von Bertalanffy introduced the term 'flow equilibrium'. All of the parts of a system interact in an input/output configuration, similar to the metabolism of the human body, but in a context of growth. A system is held in a state of tension between its components. When there is a disturbance in the environment, the tensions between the system's components increase. This creates energy and continues until enough energy is produced to drive the structure of the system into a new form, in the manner of a quantum leap. The relationships between the components of the system change, in order that the whole system can continue to evolve in its changed environment. The point at which change occurs is called a bifurcation point and the overall process is

one of self-renewal. Bertalanffy accepted that a whole system is greater than the sum of its parts. The way that the parts are arranged - the organisation of the system - creates energy. If they are arranged badly, entropy is created - a tendency to disorganisation and ultimately the destruction of the system.

The Concept of Systems Behaviour

Ackoff, in his 1997 interview with William Finnie, points out that a system's behaviour cannot be explained by the behaviour of and relationship between its parts, ie, by knowledge of its structure and how it works. To explain the behaviour of a system we must understand its function in the larger system of which it is a part. In other words, understanding cannot be obtained by analytical-causal thinking. This introduced the call for a new way of thinking. By looking at a system as a whole and its relation to its environment, we also introduce two other concepts: the idea of a greater system or world view (*Weltanschauung*) of the environment with our particular system under consideration within it; and the concept that science and the humanities are no longer seen as separate activities but different and inseparable aspects of the same activity. In this way, the humanities may enable us to identify and formulate problems and the sciences to treat them effectively (Finnie 1997).

Ackoff (1997) continues by suggesting three principles for using systems thinking in management. His first principle is that management should be directed at the interaction of parts of the system, not the action of the parts taken separately. He illustrates this by explaining that the performance of the system depends on how the parts fit together, not how they perform separately. His second principle is that problems are not 'best treated' where they appear. He suggests we move our thinking away from disciplines and functional analysis and focus on the system as a whole. His third principle is that problems are recognised as abstractions, which can be abstracted from reality by analysis. Our experiences are those of dealing with the system as a whole, therefore we need to deal with the systems problems systematically, ie, as the parts interact with each other, rather than individually. He also adds that systems thinking has taught us the importance of control by employing feedback on the outcome of what the system does, continuously diagnosing mistakes and errors and taking corrective action (Finnie 1997).

This representation of a system can provide a basic starting point for discussing and thinking about patterns and events that cause problems. It can also illustrate the system's structure or architecture that in turn can enable access to ways in which changes in the system's behaviour may be achieved. In addition, by examining the system diagram it can help us identify loops that may be less evident on initial observation. The system's behaviour depends on the total structure; so by addressing problems at a system level rather than at an event level, we can look at problems on a more holistic basis and with the expectation that any intervention or change may be long lasting.

However, Anderson and Johnson's work does not address the differences in systems as seen by different participants. The graphic representation of a system reflects the assumptions of the individual author and so is limited to the issues and events important to that author. Consequently, a group approach, such as soft systems methodology, is more likely to provide a more representative diagram, as it can benefit from the multiple viewpoints of the participants.

Systems Thinking

Systems thinking introduced a new or different way of thinking. Systems thinking takes thoughts and actions and links them in a circle of causality, leading to more robust and balanced way of thinking. Ackoff (1981) points out that systems thinking has considerably more power and usefulness in understanding and explaining how complex systems work.

Most Western languages are linear in form with their noun - verb - noun construction encouraging a linear train of thought leading to the development of lineal causal concepts. This style of thinking is commonly known as rational-analytical thinking and was the style of thinking promoted by Descartes (1596-1650) in his *Discours de la Methode*. Rational-analytical thinking can be an effective problem solving approach, especially if the problems have linear causal relationships. However, there is an underlying assumption in this thought pattern that breaking a system down into its elements will reduce the complexity of the system and will eventually expose the

cause of a problem. Yet many of the problems facing managers today could not be characterised as those with linear causal relationships, but rather are caused by a web of interconnected circular relationships leading to a high level of complexity. When the human element, with its wide range of variables, is introduced into the relationship, the situation becomes increasingly more complex and messy. Ackoff (1981) also points out that the rational-analytical thinking approach has serious limitations in that it is not very useful in explaining how complex systems work. To facilitate our understanding of, and ability to deal with, such complex and messy problem situations, a more appropriate approach is needed. Systems thinking can provide such an approach. Systems thinking is a way of understanding the causal relationships between the parts of a system. It is based on a fundamental set of notions, which proposes that systems behaviour is the result of the way the system is structured and circular patterns of cause and effect relations. When both systems thinking and rational-analytical thinking are used together, there is a significantly increased potential to gain insight into how and why complex systems behave as they do (Cavaleri and Obloj 1993).

Systems thinking shifts attention from one-time events to processes over time; it identifies the interdependencies that drive behaviour and enables leaders to select high-leverage interventions for lasting results. It forces people to step back and to challenge mental models and see the breakthrough opportunities that reside outside the boundaries we have (often unintentionally) established (Gardner and DeMello 1993).

The key concept advanced by systems thinking is that the leverage for organisational transformation comes from the ability to view interdependency among various elements of the system and locating leverage points to influence future actions. Jambekar (1995) suggests that in today's fast paced environment, an executive's experiential and operational domain is made up of events and reactive actions. To act on the system, one needs to distance oneself from the operational domain to see the interdependencies and to move out in time to understand the underlying time-varying behaviour. This requires that we need to work at three levels of understanding: events, time-varying behaviour or pattern of events and underlying systemic structure.

At the level of systemic structure, we begin to see and understand what creates the pattern of events we observe and then take action to change the process structures. It allows us to

address the root cause of the problem rather than deal with symptoms or events. Systems thinking enables us to focus on the level of structure that provides the greatest leverage for solving complex problems. The purpose of this approach is to recondition our thinking, in order to be able to see structure at work and to see the leverage in those structures. Systemic thinking offers a framework that leads to a better understanding of change in the operational domain of events in which we live. As we move from the level of events towards the level of systemic structure, the focus also shifts from short-term orientation to longer-term orientation. There is, however, a time requirement in developing skill and expertise in systems thinking techniques (Jambekar 1995).

When analysing systems we need to consider the system as a whole rather than analysing its components. This is where systems thinking presents a different paradigm from mechanistic or rational analytical thinking. The behaviour of the system depends on how the parts are related rather than on the parts themselves (O'Connor and McDermott 1997). Therefore, to understand a system, we need to consider it holistically. Ackoff (1993) describes a system, as being more than the sum of its parts - it is the product of their interactions. A system subsumes its parts and can be part of a larger system. In fact Aristotle is credited with formulating the statement that 'The whole is more than the sum of the parts' when postulating his worldview with its holistic and theological notions.

Checkland (2000) classifies systems by looking at natural systems which also include mankind. He then considers designed physical systems, which includes structures and machines and designed abstract systems such as mathematics. Further to this, he identifies human activity systems, where man can express his self-consciousness. It is within human activity systems that we find social systems. Social and cultural systems are those formed by people living or working together either in their natural environment, or by coming together in groups for a purpose such as sport.

APPENDIX C

Previous Research Experience

The interpretive process can benefit from experience and exposure to complex situations. The researcher has had significant experience in data collection using observation and interview techniques in industry. He has worked as a senior manager with Caterpillar Tractor Co. where he was responsible for conducting intensive studies of repair facility efficiency. He has also worked as a general consultant to the construction industry and the clothing industry where he conducted studies in work value and job design, gathering data by observation and interview. He has been a board member of two senior secondary colleges in Melbourne, and more recently has been a lecturer in systems engineering and engineering management. His master degree minor thesis was on the subject of the viability of a Technology Park. His research for this topic was again conducted by observations and interviews. This experience has helped hone the skills of the researcher, and has also enabled him to immerse himself in the culture of the various organizations, where ideas and learning experiences have been generated by the diversity of people's philosophies and world-views. Many of these ideas have been instrumental in leveraging change in their respective organisations.