Ways of Seeing Wholes:
Systemic Problem Structuring Methods for the Uninitiated

Michael C Charlton

A thesis submitted in partial fulfilment of the requirements of
Sheffield Hallam University
for the degree of Doctor of Philosophy

November 2021

Candidate Declaration

I hereby declare that:

1. I have not been enrolled for another award of the University, or other academic or professional organisation, whilst undertaking my research degree.

2. None of the material contained in the thesis has been used in any other submission for an academic award.

3. I am aware of and understand the University's policy on plagiarism and certify that this thesis is my own work. The use of all published or other sources of material consulted have been properly and fully acknowledged.

4. The work undertaken towards the thesis has been conducted in accordance with the SHU Principles of Integrity in Research and the SHU Research Ethics Policy.

5. The word count of the thesis is 86,227.

Name	*Michael C Charlton*
Date	*November, 2021*
Award	*PhD*
Faculty	*Business, Technology and Engineering (BTE)*
Director(s) of Studies	*Dr. Richard Breese*

Ways of Seeing Wholes: Systemic Problem Structuring Methods for the Uninitiated

Michael Charlton

Sheffield Hallam University, November 2021

Softer forms of systems thinking and Soft-OR (Operational Research) provide the theory, the methodology and the methods by which managers can see the situations they are trying to manage as *wholes*. They facilitate what has become known as “bigger picture” thinking and are widely acknowledged as effective ways to manage complexity. But despite nearly 50 years of development, the extent to which these ideas have penetrated mainstream management thinking and practice is very limited. Existing research suggests that adoption of systemic problem structuring methods (systemic PSMs) is frustrated by a number of factors. But questions about the take-up of systemic PSMs remain under-theorised. This thesis aims to deepen our understanding of how managers receive and take-up, and sometimes repudiate, systemic PSMs. It uses a qualitative multiple case study design to report findings from four interventions using systemic PSMs in four organisations (two from the UK and two from Romania). The findings are interpreted through the lens of Luhmann’s complex social systems theory. Applications of softer forms of systems thinking are better received and are more likely to be taken-up in situations where an existing organisational decision premise is contested and no longer functions as a stable reference point for future decisions. In these circumstances, managers show greater curiosity in systemic PSMs and are more willing to adopt them to generate new “ways of seeing”. However, they also present managers with a paradox. Used as a means to explore an organisation’s *future*, and as a means of deciding what that future could be, managers are more reluctant to perform “bigger picture” analyses if the product of such thinking is perceived to over-specify plans for the future; plans which might well turn out to be ill-adapted to a “future” that is fundamentally unknown. This changes the way we think about interventions using systemic PSMs and leads to a theory that produces a more nuanced understanding of the circumstances in which they might be needed and effectively deployed. Existing theory tends to focus on ideal-type *problem contexts.* But the near-manifestation of such contexts in actual practice does not automatically guarantee that systems-inquiring methods will be taken-up, for existing theory underplays the inherent *decision logic* of the organisation in which the intervention takes place and underestimates the organisation’s ability to create its own “secondary complexity”. Systemic PSMs are more likely to be in demand when existing “ways of seeing” have been exhausted.

Acknowledgements

The opportunity to write a thesis is contingent on a number of factors, not least a huge amount of good fortune. I am fortunate enough to have the support, encouragement and advice of many colleagues, friends, and family members without which this thesis would never have seen the light of day, and to whom I express my deepest appreciation.

I would like to thank my former tutor Michael C. Jackson, Emeritus Professor of Management Systems at the University of Hull for introducing me to systems ideas in the first place. I am not sure he would agree with many of the ideas in this thesis, but it is his work that originally inspired my interest in the subject. His latest work continues to sustain my interest

I would also like to put on record my gratitude to my supervisory team, Dr Richard Breese and Dr Paul Wyton. Richard has stayed the course over the too-long period of time I have 'enjoyed' in putting all of this together, and I thank him for his patience and perseverance. I also thank my line managers during the time I was registered on the doctoral programme. Both Dr David Jones and Dr Lucian Tipi have been immensely helpful, and flexible, in doing what they can to support me on this project and helping me to manage my full-time workload and part-time study. June Clarke too has been very helpful with her 'no-nonsense' practical advice, encouragement, and good humour.

My sincere thanks to all the managers that allowed me access to their organisations and for talking at length to me about management, problem solving and systems ideas. They remain anonymous as per our agreement, but they know who they are. Special thanks go to Professor Monica Zaharie at Universitatea Babeş-Bolyai, who introduced me to numerous Romanian companies, two of which agreed to take part in the research.

Special thanks go to my family. I thank my wife, Antonia Charlton, for her support, encouragement and for enduring all of the postponements, unavailability, and cancelled invitations. I know about the sacrifices that have been made. And finally, to my greatest fortune of all: my parents, John and Beryl Charlton. From modest beginnings in Blackpool, they brought up three sons and fashioned a senior financial controller, an engineer and an academic. They built a loving family and in doing so made a contribution far greater than any thesis can claim. They taught me how to question things and encouraged me to be fair-minded. Those who know me well will know that I am still working on this; but there can be no doubt about the head start I was given, and this was my parents' doing. This thesis is dedicated to them.

Table of Contents

List of Appendices

List of Figures

List of Tables

Chapter 1 Introduction

1.1. Rationale

This thesis is about systems thinking and why so few systems approaches get taken-up or adopted by practising managers. This is an important matter and is counter intuitive. It is important because the wider use of systems thinking is seen as a good thing. For example, the United Nations (UN) considers systems thinking to be a key leadership skill and has created a "systems leadership framework" which influences matters of leader selection, training and culture in the UN (UN, 2017). And the Organisation for Economic Cooperation & Development (OECD) identifies systems approaches as a major trend and enabler in public sector innovation (Organisation for Economic Cooperation & Development [OECD], 2018). More recently, in an interview for the BBC's *The Life Scientific,* the UK Government's chief scientific advisor, Sir Patrick Vallance, has called for more use of systems thinking in Government scientific advice (BBC Radio, 2021). It is counter-intuitive because systems thinking has been well established now for over 40 years. It continues to expand with new methodologies and methods, and it continues to be vigorously debated in academic circles. And yet, despite all these years of development and refinement, the extent to which it has penetrated mainstream management thinking is underwhelming.

Describing systems thinking quickly to a newcomer is no easy task. To begin with it is a trans-discipline and so is unconstrained by disciplinary boundaries (Rousseau & Wilby, 2014; Jackson, 2019). Its ideas (and I use the phrases systems thinking and systems ideas interchangeably) operate at a high level of abstraction and are applied to many different disciplines, including biology, ecology, psychology, sociology, public health, and in the case of this thesis, management. There are numerous conceptual ideas – e.g., system, environment, complexity, boundary, hierarchy, emergence etc. – which have been incorporated into numerous approaches, methodologies, and methods and they all mean different things depending on whom one talks too. One might

think of relatively simple ways to start a conversation about systems thinking, for example, to describe how the world is vastly inter-connected, or that the whole is greater than the sum of its parts, or that reductionism can lead to unintended consequences, but one always feels that something has been left out, or one is doing an injustice to the vast range of ideas. In summary, therefore, there is no easy way to quickly convey what systems thinking means; especially to the uninitiated. However, and wherever it is possible, it is the job of this thesis to make this picture a little clearer and to describe how there are different ways of seeing wholes. I will have more to say about labels, schools of thought, methodologies and multi-methodologies in chapter 2 and will try to make the demarcations as clear as possible, but there has to be some recognition at this early stage that the subject of systems thinking is at times "vague and ambiguous" (Cabrera, 2006). There is a plurality of ideas which make the topic both baffling and fascinating at the same time. Cabrera (2006) has made a significant attempt to clarify the construct of systems thinking and for him it is no less than a universal and patterned way of *thinking*. These ways of thinking are supported by a variety of systems concepts which have been incorporated into a variety of systems methodologies and methods. This makes the ideas more accessible, and in particular it makes them accessible to general managers. And if they are generally accessible, one might reasonably ask why the ideas and methods are not more widely adopted in management practice.

This chapter is divided into 5 sections. Section 1.2 tries to define the scope of the thesis, its key terms, and labels. It attempts to provide some of the sharper clarity just referred to. Section 1.3 contains a short biographical sketch telling the story of how I grew to be interested in systems ideas, first as a student, then as a manager and now as a student again. Section 1.4 anticipates the critical literature review chapter (chapter 2) and summarises the current state of knowledge about the obstacles to the adoption of systemic PSMs. It emphasises the gaps in our knowledge and why this should matter to us. Section 1.5 describes the research questions and research aims for this thesis. The chapter ends with an outline of the structure of the thesis and a short conclusion.

1.2. The scope of the thesis and some conceptual clarification

To make the task more manageable this thesis is about *systemic problem structuring methods* or "systemic PSMs" (Midgley et al, 2013) – a family of methods, usually involving participation in some way, that bring together a set of stakeholders to define and discuss a problem situation, create multiple structured representations of that problem – usually in the form of qualitative models – so that various understandings can be shared, an accommodation of views can be reached, and agreements made in order to take action to address the problem situation. I will refer to these methods as systemic PSMs, after Midgley et al (2013). This is a far from satisfactory label, but it is a necessary compromise. It is unsatisfactory in three ways. First, it lacks elegance and sounds convoluted; not a good start for enlightening the uninitiated. Secondly, the PSM part of the noun phrase has been the subject of debate in the academic literature with Eden & Ackermann (2006), two leading acolytes from the subject area, calling on researchers to "stop calling them PSMs". They prefer to see the methods as "facilitated agreements to act" (Eden & Ackermann, 2006) and yet a new name has not emerged. Finally, the label explicitly refers to *methods* and I will have cause, at times, to discuss methodology or systems approaches, and by this, I mean the principles that guide the choice of methods. Despite these limitations it does have some advantages. It brings together in a compound form the notion of *system* and *problem structuring*. In other words, it expresses a particular type of problem structuring which emphasises a reference to a system, or a whole, or multiple systems, or the "bigger picture", rather than merely the parts of a system. It also reflects two different communities of scholars both of whom share an interest in practice and in intervention. The *systemic* adjective appeals to those who may wish to call themselves *systems thinkers*, and the *PSM* element appeals to those who are advocates of *Soft-O.R.* (Soft or qualitative operational research), so the compound noun phrase at least has the virtue of being inclusive. Finally, the label is recognised in the current literature and is certainly recognised by the "initiated". And at present I know of no better alternative.

There is generally broad agreement on the characteristics of problems that systemic PSMs are designed to address. They are described as wicked

problems (Rittel & Webber 1973); or “super-wicked problems” (Levin, Cashore, Bernstein & Auld, 2009); they “fizz with social complexity“ (Checkland & Poulter, 2006); they “defy description” (Rosenhead, 2006); there are multiple stakeholders (Jackson, 2019; Gregory, Atkins, Midgley & Hodgson 2020) with no or little agreement about goals or objectives (Rosenhead, 2006); they are dynamic and interact with other problems (Gregory et al., 2020); there are “intangibles” and “uncertainties” (Rosenhead, 2006) and conflicting interests. Ackoff (1979) sums them up well; he calls them “messes”.

1.3. A short biographical note

I first became aware of systems thinking in the late 1980s and early 1990s. I was a naive undergraduate studying for a degree in Management Systems and I found systems ideas very different to other management ideas, ones that were unflatteringly referred to as “fads”, ideas like TQM and performance measurement. Systems ideas were more general, more far-reaching and they seemed to have much more potential. They were rooted in and connected to science, e.g., to General Systems Theory (von Bertalanffy, 1968) and to Cybernetics (Ashby, 1957; Beer, 1966; Beer 1979; Beer, 1981, Beer, 1985). In Peter Checkland, and through his landmark book *Systems Thinking, Systems Practice* (1981), which incidentally was the first systems book I ever read, the soft systems movement had its leading spokesperson, an heir to Churchman, and required reading on my course at the University of Hull.

In the 1960s and 1970s a team at the University of Lancaster had taken systems thinking – which was then synonymous with systems engineering – outside of the university, to work on “real-world” action research problems (Checkland, 1999, pA6). They found the systems engineering approach of the day wanting, it was unable to fully address the complexity of human situations, and soft systems methodology (SSM) was conceived as a result (Checkland & Poulter, 2006). By the end of the 1980s, a different group of Management Scientists were making similar waves in their profession: Operational Research (O.R.). Methods like Strategic Options Development & Analysis (SODA), Strategic Choice (SC) and Robustness Analysis (RA) were brought together along with other emerging methods (Rosenhead & Mingers, 2001). Collectively they became known as Soft OR, alternatively problem structuring methods

(PSMs). Not all of them were built on systems thinking concepts and ideas, but they are undeniably close allies (Midgley, 2000).

In the meantime, and from around the 1980s right up to the present, a *critical systems thinking* movement was growing, and its leading figures – Mike Jackson, Robert Flood, John Mingers, and Gerald Midgley - kept tabs on the methodologies and ideas that were emerging elsewhere, they brought some order and coherence to all of the developments, provided guidance on what would work best, where, and why; and they continued to develop practice by creating multi-methodologies.

As an undergraduate these were very exciting ideas. They appeared to be theoretically robust and seemed capable of being put to good use in so many different problem situations. After university, I worked as a commercial manager and then as a project consultant. I found it surprising that there was so little awareness of systems thinking and systemic PSMs. No one ever used the ideas in the organisations I worked with and for. The knowledge-practice gap was vast.

Of course, the history of these ideas is better captured by the main protagonists (e.g., Checkland, 1999, Jackson 2000; 2003; 2019; Wilson & Van Haperan, 2015). The intention of this section is merely to give readers a flavour of some of the developments and to explain my interest in them. My interest in these ideas has not waned. In fact, if anything, my interest in the subject runs deeper, as a result of this project and out of a necessity to attend to two important roles in undertaking the research: the consultant role and the researcher role. More will be said about these two roles in chapter 3 (methodology). The research question is driven by the need to find out why systems ideas and methods are not more widely adopted. The next section examines some of what we already know about the obstacles to greater adoption of systemic PSMs and therefore anticipates and summarises some of the key arguments of chapter 2.

1.4. What we know about obstacles to the adoption of systems thinking

In chapter 2 three themes are used as a structuring device to enable a critical review of selected systemic PSMs and multimethodologies. Partly inspired by Keys (2007c), these three themes *indirectly* report obstacles to further adoption of systemic PSMs. The first theme is about the *value* of using systemic PSMs. This is difficult to establish beyond reasonable doubt and indeed for some the question of value is "undecidable" (Checkland & Scholes, 1990). From this it might be reasonable to infer that practising managers are unlikely to adopt new ideas unless the value in doing so exceeds the effort required to acquire knowledge of them (Warren, 2004). The second theme – *expertise* – suggests that with a limited base of "skilled practitioners" and slow "apprenticeship-based growth" (Rosenhead, 2006, p.763) the take-up of systemic PSMs will be at best sluggish. The third theme is the *distinctiveness or identity* of systems thinking and systemic PSMs to which I have alluded above. This strand is fuzzier. On the one hand a clear identity for what systemic PSMs are, their links to professional bodies and accreditation will, all things being equal, lead to greater recognition, acceptance and use. Again, it might be reasonable to assume that in the absence of strong professional identity, systemic PSMs will continue to operate in the margins. On the other hand, if systemic PSMs lack distinctiveness and something that "looks like" a systemic PSM is – contrary to expectation - commonplace in organisations then the question is turned on its head and research is directed to detecting "putative" uses of systems thinking and practice (see Yearworth and White, 2014 in relation to the "putative" use of PSMs). Finally, a fourth and more *direct* explanation for the lack of adoption of systems thinking was made by Ackoff (2006), based purely on his personal experience of practice. Systems thinking is too "radical"; the "sin of omission" is not necessarily reproachable (Ackoff, 2006); so why bother?

In summary, therefore, there are four potential obstacles to the greater acceptance and adoption of systems thinking and practice:

1. The obstacle of demonstrating acceptable value
2. The obstacle of insufficient expertise
3. The obstacle of an adequate identity

4. The obstacle of being too radical.

It is recognised that the third obstacle is double edged; it is paradoxical. If systemic PSMs are indistinguishable from other management methods and practices, then the question of adoption is no longer problematical. Research must be directed into efforts of *detection*. To paraphrase Gregory & Atkins (2012), “it looks like systems thinking and it does what a systemic PSM does but is it a systemic PSM?”.

1.4.1. Gaps in understanding and knowledge

The latest research efforts to understand the obstacles preventing further adoption and greater use of systemic PSMs are immensely helpful in improving our understanding of it. They have a strong practical orientation and theorise how systemic PSM use occurs, rather than just assume that demand for systemic PSMs is given. A multitude of different theoretical perspectives are used including practice theory (Ormerod, 2014, 2017; Burger, White & Yearworth, 2019) and Actor-Network-Theory (Tully et al, 2019) This helps to frame investigations and useful insights are produced. However, the vast majority of these efforts fail to fully take into account the existing problem-solving capabilities of the organisations they intervene in. They fail to adequately explain how systems ideas and methods sit side-by-side with the extant *preferences* of managers to pursue problem solving in the way that they see fit – the way things are managed currently. Nor does the current research pay enough attention to the *context* within which interventions take place, more specifically the *organized complexity* that is present when interventions are carried out in *organizations*. This can mean that opportunities for better understanding of how systemic PSMs complement or challenge existing problem-solving preferences and orientations might be missed; orientations that have come about because of specific *decisions* made by the organizations that are the context of the intervention. The purpose of the most recent research has been to better understand *the efficacy of the methods* in creating new and productive ways of understanding problem situations and in creating commitment to action by those involved. An unintended consequence of this is that this promise of better understanding implies “better” than that which can be obtained by other means. Existing practices tend to be bracketed out of the

presentation of findings in case studies. The assumption, made by most researchers, and one that seems eminently reasonable, is that the creation of systems models to capture relevant wholes and the interactions that follow from this helps to clarify logic, determines what is relevant and what is irrelevant etc. and this leads to new understandings and insights. The question of whether the participants and moreover the individual(s) commissioning the work actually want to take part in the process to represent relevant *wholes* remains backgrounded. This is understandable because the researchers have already gained access and approval to use a systemic PSM. Any "commissioners" are already signed up to seeing their situation explored using relevant systemic PSMs. Of course, this helps research to proceed in an orderly way. But it is surprising that so little of the literature discusses how practising managers' existing (and preferred) methods of problem-solving are dislodged or suspended during an intervention, and how or if these preferred methods re-assert themselves during or after an intervention (Ormerod, 2017 is an exception for *during* an intervention). Much of this is explained by the "one-off and temporary" nature of many interventions (White, Yearworth & Burger, 2015).

An alternative starting point, however, is to ask why are so many interventions "one-off and temporary", why have systems approaches not become domesticated and mainstream? Whilst many case studies reporting systemic PSMs consistently emphasise the importance of the context of the situation and the challenges faced by the agent of intervention or the consultant (Ackermann, Alexander, Stephens & Pincombe, 2020; Keys & Midgley, 2002; Ormerod, 2014a; 2014b; 2017;) they tend to pass over the issue that systemic PSMs are jockeying for position with other existing and preferred ways of tackling problem situations; other routines in effect. This could be a form of quality management or business process management or project management technique or some form of bespoke ad-hoc approach which is difficult to categorise. The question of whether and how systemic PSMs replace, subvert, complement, or even reinforce existing routines is for the most part unexplored. There is no or little serious effort in finding out why and how those preferred methods persist. The "revival" of behavioural operational research (BOR) (Franco and Hämäläinen, 2016) together with research on the practice/process of OR (Keys & Midgley,

2002; Ormerod, 2017) illuminates how managers act and interact *when involved* in a systems study but its potential to explain the wider phenomenon of adoption, integration and penetration is limited. For this reason, a different approach is called for.

1.4.2. Why does this matter?

Increasing our understanding of this issue is important for practical and theoretical reasons. Scholars and practitioners lack an adequate theoretical understanding of why systemic PSMs do not get the support or endorsement that they perhaps merit. Progress on understanding this phenomenon has been slow and is a persistent blockage to the further development of systemic PSMs (Morrill, 2007). If a better understanding is obtainable, then a better means of supporting the aims of bodies like the UN and the OECD may be possible (and countless other organisations of course). If the impediments to greater adoption can be better grounded in theory, then realistic ambitions for the future of systemic PSMs may be established. Successful intervention using these ideas will become more predictable.

1.5. Research questions and aims

The current literature suggests some obstacles to wider adoption but falls short in fully explaining the circumstances in which practising managers accept and accommodate systemic PSMs alongside their existing practice, and the circumstances in which they might resist systemic PSMs. In order to make up for this a number of research questions were designed as follows:

- How do practising managers who are new to systemic PSMs *accommodate* systems ideas? Under what circumstances, if at all, do they resist systemic PSMs? How do they combine these ideas, if at all, with their existing and preferred ways of managing complex problems? How, if at all, does the organization(s) - which is the main context for systemic PSM application – facilitate or constrain the deployment of systemic PSMs?

- What evidence is there that practising managers employ, or want to employ, systems concepts (e.g., emergent properties of the whole,

hierarchy, communication and control, relationships between elements) and systemic PSMs to explore and learn about their problem situations, and to take action?

In order to shed light on these questions, the research has three broad aims:

- To examine the practical relevance of systemic PSM interventions in addressing complex problem situations with managers in four case study organisations.
- To examine how these interventions compare to existing problem-solving practices in each of the case study organisations.
- To build a theory of how and why practising managers accommodate and/or resist systemic PSM.

These aims serve the wider purpose of enhancing our knowledge about the adoption and application of systemic PSMs, making a contribution to the literature. These contributions are set out in chapter 6.

1.6. The structure of this thesis

The thesis is divided into 7 chapters. Chapter 2 is a critical literature review which elaborates on the current knowledge that we have about adoption and referred to above. Chapter 3 describes the research methodology designed to address the above questions. A multiple case-study approach is proposed and defended. It includes elements of action research. Chapter 4 then presents the narrative descriptions of the four case studies. There is some interpretation of the results in chapter 4, but this continues into chapter 5 with some cross-case analysis and a reinterpretation of the cases through the lens of Luhmann's (2018) complex social systems theory. The results provide the basis for theory construction in chapter 6 where the contributions to knowledge are outlined. A short summary of the research is included in chapter 7 with some suggestions for future research. There are multiple appendices that describe the evolution and current interest in systems methodologies and systemic PSMs, and the research protocols adopted for the present study.

1.7. Conclusion

This chapter has set the scene for the remainder of the thesis. Systemic PSMs are widely discussed and researched in the academic literature, but the extent to which they have influenced mainstream management practice is highly questionable. I gave a preview of some of the literature that addresses this lack of adoption and informs what we know now about obstacles to further adoption. But there are gaps in what we know, and the current literature says little about the problem-solving approaches that currently occupy management practice and how these might complement or be displaced by systemic PSMs. I argued that adoption or take-up is under-theorised and put forward a range of research questions that need to be addressed if we are to know more about the theory and practice of systemic PSMs.

Chapter 2 A Critical Literature Review

2.1. Introduction

In the introduction to this thesis, I asserted that systems thinking and Soft-OR provides the theory, the methodology, the methods, and the tools by which managers can see the situations they are trying to manage as *wholes*. In short - and with due acknowledgment to the title of John Berger's (1972) classic book on art - systems thinking and soft-OR provides managers with "*ways of seeing wholes"*. If seeing wholes is deemed to be an important aspect of management practice, we are entitled to ask why these ideas and methods are not in wider circulation. Why is the take-up of system ideas so marginal?

Several explanations for this state of affairs are teased out in this chapter by explaining developments in systems thinking and Soft OR. There is no shortage of debate about systems theory and methodology in the academic literature, as this chapter will show, and some of this refers directly or indirectly to the question of take-up or adoption.

In this chapter, I will set out a review of some of the key literature that has shaped research on systems thinking and PSM over the past 25 years. In section 2.2 some remarks are made about the methodology of the literature review, and the choices that were made to define a manageable list of relevant sources. A number of important themes begin to emerge in section 2.3, partly inspired by Keys (2007c). These themes are:

(1) the value or effectiveness of systems thinking/PSM;

(2) the level of expertise required to implement systems thinking approaches/ Systemic PSMs; and

(3) the overall identity and distinctiveness of the field, or discipline, of systems thinking/soft-OR.

How these themes relate to the over-arching research question is explained, and I argue that the themes are important in developing an overall understanding of the problem of adoption, or “take-up”. A fourth theme is added later, which reports a more *direct* approach to the question of adoption.

In section 2.4 I argue that a would-be systems practitioner (a convert or newcomer) might reasonably look for support on theory, methodology, method and the process of intervention from two separate communities: the Soft-OR community, and the critical systems thinking community. Space will be devoted to each community, and to the most influential methodologies in each literature strand, with a special emphasis on problems that are sometimes described as “messes” (Ackoff, 1979). One of the methodologies – Soft Systems Methodology – spans both communities and is presented in its own right because of its significance to both Soft-OR and to critical systems thinking. I will describe the methodologies and their evolution, outline similarities and differences, describe different research foci and where these overlap. The “heavy lifting” of description and critical commentary will be done in **Appendix A** through to **Appendix F**. This gives readers who are familiar with the methodologies a chance to dip in and out of the appendices as they see fit. It also allows more space in the chapter to discuss the relative strengths and weaknesses of each approach (*value*), the *expertise* required to implement the ideas and the overall *identity and distinctiveness* of each approach will be assessed. Throughout the discussion, attempts are made to problematize some of the key assumptions, leading to the chapter's conclusions.

2.2. On the methodology of the literature review and its methods

In this section I cover the justification of the selection criteria for the literature review, discuss what is included and excluded, highlight explicit forms of analysis and synthesis, and reflect on the choices that have been made in the process of building this critical literature review. The review is a conventional narrative review (Booth, Papaioannou & Sutton, 2012).

This thesis is about systems approaches that pertain to the activity of *managing*, understood in its broadest sense. The field of study is perhaps best summed up by the title of one of its key texts, *Systems Approaches to Management* (Jackson, 2000). The study assumes a more-or-less recognisable body of knowledge on systems thinking published in the literature. A practitioner

of the "systems approach", for example, may associate with a particular methodology – e.g., SSM; or a multi-methodological systems approach, e.g., critical systems thinking/practice (CST/CSP) (Jackson, 2019), or systemic intervention (SI) (Midgley, 2000); or be a Soft OR advocate. The vast majority of literature is happy to package these approaches together, as operating in the same kind of territory, as belonging to the same broad church.

Many writers on systems science, systems thinking and soft OR also take a broad view on what the activity of *managing* means and how *management* and *managers* might be defined. This is arguably one of the field's biggest attractions, making systems science transdisciplinary in scope (Rousseau, Wilby, Billingham & Blachfellner, 2018) with a vast range of actual and potential application. Some of the earliest and best-known applications of the systems approach, like Meadows, Randers & Meadows' *The Limits to Growth* (1972/2005) are described in Midgley's (2003) *Systems Thinking Volumes 1 to 4* as "large scale modelling approaches". Here the idea of "management" is closely linked with policy making and with decision making at a very high level. Large scale modelling like this is expert driven, intended for specialist audiences. But systems thinking and systemic PSMs also provide methodologies and methods which are not expert driven. It supplies ideas, and powerful qualitative tools, which can, with some familiarisation, be used as "take-aways" by interested managers. The point here is to narrow the field of interest and to exclude from this thesis the type of systems thinking best described as large-scale modelling, which involves sophisticated simulation and modelling, which is best left to experts. The focus here is on managers and management commonly understood; the way they tackle their own "complex", "wicked", "messy", "swampy" problems (see Ackoff, 1981; Rittel & Weber, 1973; Schon, 1983). It is assumed that managers have some level of interest in "take away" approaches. That said, the assumptions that systems approaches and soft-OR make about management and managers, as agents, are often "weakly articulated" (Alvesson & Sandberg, 2013) and are therefore highlighted at this point in the discussion. Mingers (1997) makes a similar point. I have more to say about these assumptions later and in the conclusion.

> This thesis looks *outwards*, towards managers and their concerns, and not *inwards* to the concerns of educationalists and training providers. I

use the term "inwards", to draw attention to my own role as a professional academic in Higher Education (HE) and make the inwards/outwards distinction at this point to further underline what is included in the thesis and what is beyond its scope. This is not to deny the possible effects that education and training *could have*, and perhaps *should have*, on the wider adoption of systemic PSM. It is more a recognition that, despite the wishes of the UK's chief scientist described in chapter 1, there is very little educational provision of systemic PSM among HE institutions. And where there is provision, it tends to be confined to a small group of universities: The Open University, Hull, Lancaster, Warwick, Strathclyde and Kent are all examples, but even here, the provision is small-scale, save for the Open University (OU), which caters for more mature, distance-learners, and is most likely to have been the largest provider of systemic PSM education over the past 50 years. Ison and Straw (2020) estimate that over 40,000 students have passed through the OU's systems programmes. There is also evidence to suggest that systemic PSM is something of a British pre-occupation, even an English one, if the number of scientific papers published by major authors in the field is a reliable proxy measure for likely educational provision (see Mingers, 2011 on the lack of scientific publishing by non-UK academics on the topic of soft OR).

Much of this can be explained by a lack of awareness of what systems thinking is, as referred to in section 1.1. This makes it difficult for course or module designers to create curricula which is easily understood by would-be learners or university managers. In my experience, opportunities to teach systemic PSM are very rare. Methodologies might be described and practised in workshops, but only as a constituent part of another 'mainstream' module. SSM might be covered in one three-hour session for a module, or unit, on creative problem solving, for example. Teaching systems methodologies to inexperienced undergraduates is also recognised to be a challenge (Hindle, 2011). Younger undergraduate learners generally lack experience of the wider world, and this may explain why the OU's programmes are successful and more durable. As HE changes and more apprenticeship

> programmes are created - for example, the "systems thinking practitioner" apprentice standard was established and approved in 2020 (IATE, 2020) – provision may increase. But for now, systemic PSM training is rather scarce, and this is likely to retard the take-up of systemic PSM. Even so, if the methodologies and methods that make up systemic PSM are designed as "take-aways", and if they are little more than “organised ways of thinking”, there is no reason why we should not inquire about why they are not more widely used.

Having set out some very broad ideas about *systems methodology* and *management* the aim now is to describe how searches for relevant literature were made using electronic databases. The SCOPUS (2019) database was queried using the following search terms: "Systems Thinking"; "Soft OR"; "Problem Structuring"; "systems methodology". Further searches of these terms were undertaken alongside words like "value"; "adoption"; "practice" and "translation"; the latter term recognising that systems ideas and methods might travel via a process of “translation”, rather than the taken-for-granted sense of diffusion and adoption (Czarniawska & Sevon, 2005; Czarniawska, 2011).

Further refinements were made to ensure that the literature is topical and current. Jackson’s (2003) popularising book *Systems Thinking: Creative Holism for Managers*, written for a practitioner audience, was a key source of inspiration for this thesis. In it he revisits the topic of "fads and fashions in management", which was part of an earlier publication (Jackson, 1995). An underlying assumption in that study is that systems thinking is largely absent in managerial practice because managers are easily side-tracked by management fads and quick fixes (Jackson, 2003). Three years later in 2006, the Journal of the Operational Research Society (JORS) published one of its periodic reviews on the status and future of PSMs. PSMs are a growth area for OR, but this growth is "moderate" and there is a sense that Soft-OR's potential has not been fully exploited (Rosenhead, 2006). There are doubts about its progress, which are voiced at conferences and in special issues (see Westcombe, Franco & Shaw, 2006). It therefore seemed reasonable to take the search back to at least 2003 to address the currency criterion, and to see how some of the key writers were, and continue to be, concerned about greater application and adoption. In no way should this be taken as questioning the value of earlier literature. This

older literature is picked up through citation chasing, and I have gone back to some original sources to examine the key works of well-known systems figures. The historical aspect of how systems approaches have developed is of vital interest to the declared aim of seeing how these ideas have travelled.

The role played by having a familiarity with the literature should also be stressed. The identification of influential writers and the inevitable part played by citation chasing, influences the shape of the literature review. Highly cited works on the subject of professional and critical literature reviews (Hart, 2018; Boote & Biele, 2005; Booth, Sutton & Papaioannou, 2016) naturally and properly refer to the goal of comprehensiveness. I hope this has been achieved but not at the expense of repeating uncritically the assumptions of the field (Alvesson & Sandberg, 2013). The literatures of systems thinking and Soft OR cover a vast terrain, but the aim here, following a problematizing approach, is to identify key literature which can then be subject to deeper reading and interrogation (Alvesson & Sandberg, 2013).

2.3. Breadth and depth of the literature

The vast scope of the literature - even the restricted scope as outlined above – offers an early clue to the question posed by the thesis. Does the body of literature present an easily identifiable unity? If so, then we can expect a relatively coherent and meaningful set of systems approaches to be presented. In turn, we might expect better recognition of systems thinking among practising managers. In this way, the *management* of breadth and diversity is an important feature of systems thinking and PSM research. Much of the time this is to meet scholarly ends, but the extent to which it presents unity and coherence to a practitioner audience should not be under-estimated. Insufficient coherence and integration are unlikely to appeal to practising managers. So, researchers face the well-known, and often cited, "double hurdle" of research (Pettigrew, 2001). For these reasons, the review undertaken here examines implications that theoretical development has for coherence, unity, organisation, and identity of systems practice or systemic PSM.

Adequate breadth also helps to do some justice to the range of theory construction that has taken place over the last 25 years. Much of this theorising can be related to the above point about intellectual coherence, the identity and

diversity of systems approaches and their organisation, but much of it also has a thematic quality which enables it to stand on its own. It includes how:

- expertise in systems/PSM practice is achieved (Keys, 2006; Tavella & Papadopoulas, 2015; Tavella, 2018);
- substantial theory on how different methodologies and methods can be selected and/or mixed to suit the problem situation at hand and how a pluralist systems enterprise is possible (Brocklesby, 1997; Flood & Jackson, 1991; Gregory, 1996; Jackson, 1990, 1997, 2000, 2019; Jackson & Keys, 1984; Midgley 1996, 1996a, 1997, 2000; Mingers, 1997a, 1997b; Mingers & Gill, 1997);
- significant theorising about the *similarities* of systems approaches/PSM (Eden & Ackermann, 2006; Smith & Shaw, 2019) or "what makes a systems approach a systems approach?", known as its "constitutive rules" (Naughton 1977; Checkland, 1981; Checkland & Scholes 1990; Holwell, 2000; Jackson, 2019; Yearworth & White, 2014);
- illuminating theory about *the process* of Soft-OR (Keys & Midgley, 2002; Keys, 2007b;), the human and social challenges of intervention using systems approaches/PSM - particularly in relation to behavioural OR (Brocklesby, 2016; Midgley, Nicholson & Brennan, 2017; Velez-Castiblanco, Brocklesby & Midgley, 2016);
- the ways in which knowledge is created during an intervention giving rise to the consideration of the status of OR/soft OR as a "design science" (Keys, 2007a, 2007b, 2007c; van Aken, Chandrasekaran & Halman, 2016);
- research that focuses on the evaluation of systems methods and PSM (Checkland & Scholes, 1990; Connell, 2001; Lami & Tavella, 2019; Midgley et al., 2013; Tully et al., 2019; White, 2006);
- and finally, theory about systems *thinking* and systems literacy (Cabrera, 2006; Cabrera & Cabrera, 2021; Midgley, 2008). These theoretical developments overlap considerably. An attempt to organise these research themes is presented in table 2.1.

Theme Number	Theme	Sub-Themes and Key Questions	Key Writing/Research	Implications and Challenges for Systemic-PSM Adoption
1	The value of systems thinking and systemic PSM	Evaluation of PSM and systems methodologies "Does it work?" The question is "undecidable" (Checkland & Scholes, 1990) Interessement and Problematisation (Tully et al, 2019) Trust, enrollment and re-problematisation (Tully et al, 2019) Context, purposes, methods and outcomes (Midgley et al, 2013)	Tully et al, 2019; Midgley et al, 2013; Ackermann, 2012; White, 2006; Eden & Ackermann, 2006; (Checkland & Scholes, 1990)	A lack of empirical evidence of effectiveness makes systems thinking and soft-OR difficult to sell
2	Expertise required and the *process* of intervention using systemic approaches/soft-OR	The nature of knowledge work Soft-OR as a Design Science Problems in teaching Soft OR and systems thinking	Keys (2000; 2006; 2007a; 2007b; 2007c;) Ormerod (2014) Tavella (2018) Hindle (2011)	The degree of expertise required to successfully implement systems thinking and PSM will influence apprenticeship and adoption. Take-up is then reliant on the development of sufficient expertise among a community of users. But expertise can be seen to protect the field, giving it a form of exclusivity. The theme relates to methodological purity theme.
3	The *identity* and overall coherence of systems thinking and/or Soft-OR and its distinctiveness of methodology/method	Multi-methodology and method mixing Meta-Theory and Paradigm (in-commensurability)	Many of the writings listed below contribute either explicitly or implicitly to the overall *identity* of the field.	If the identity of the "field" is ambiguous and/or incoherent, if it is is "confused" this will detract from its overall appeal for would-be practitioners. Methodology and method may not be adopted.

Theme Number	Theme	Sub-Themes and Key Questions	Key Writing/Research	Implications and Challenges for Systemic-PSM Adoption
		Constitutive rules - what makes a systems approach a systems approach? What makes systems thinking distinctive? What makes systems thinking different to "mainstream" management ideas and methods?	Cabrera (2006) is highly critical of the "confusion" created by systems ideas, methods and approaches. Systems thinking is "not a science, it is a conceptual framework" (Cabrera, 2006 p18.) Multi-methodology: Jackson (2019), Mingers (1997), Midgley et al (2017), Mingers & Brocklesby (1997), Mingers & Gill (1997) Constitutive Rules: Naughton (1997), Checkland & Scholes (1990), Smith & Shaw (2019), Jackson (2019); Yearworth & White (2014)	Produces diversity to cope with a range of problems but potentially creates confusion. What separates ST and soft-OR is crucial to compare and contrast with existing management routines for addressing complex, swampy problems. Opens up the question of under-reported soft-OR and systems thinking.

Table 2-1 Three essential themes in systems research influencing adoption

In 2006, Ackoff addressed the question of adoption head-on in his article “Why few organisations adopt systems thinking” (Ackoff, 2006). In it he suggested that managers would rather play safe than adapt radically new ways of thinking. He calls this phenomenon the “sins of omission”; better to do nothing than commission something that will be judged later. The “sin of omission” becomes the fourth theme, but it is not used as part of the structuring device for the discussion below. Ackoff also questioned the *presentation* of systems ideas, implying that this could be done better. His arguments, based on personal experience, deserve closer attention, but at the same time need to be contextualised with more recent research. The explanation for why adoption of systems thinking is limited or disappointing may be much more nuanced and complex. To allow for this, an adequate literature review must examine research focused on the *process* of systems thinking, the inherent value of systems thinking, the importance of requisite expertise in implementing systems approaches, and finally the identity and coherence of the systems approach as a management discipline. Such research unpacks and reveals the complexity of activity which takes place when one uses systemic PSMs, with the implication that adoption may be thwarted because there is a lack of knowledge about this process, or there is a lack of experienced users to act as carriers of what is believed to be very useful, and would be of benefit to managers and management.

2.4. Some broad choices for the newcomer to systemic PSMs

A newcomer to systems practice might reasonably look for support (on theory, practice, methodology, technique etc.) from one of two broad communities or groupings:

1. Soft-OR;
2. Critical systems thinking/practice (CST/CSP).

There is much overlap between these two communities (Jackson, 2019). Both are applied disciplines engaged in "mode 2 knowledge production" (Gibbons, 1994; Tranfield & Starkey, 1998); both make extensive use of generic qualitative modelling which is populated with data derived from the situation (Smith & Shaw, 2019); both use data that is uncertain, subjective, a matter of

dispute to those involved in the situation; the models are generally used as "devices" to learn about the situation (Checkland and Poulter, 2006). SSM in fact sits happily in the PSM family as it does within frameworks to support critical systems thinking and practice. Both communities make considerable use of action research and the case study method to help generate and test theory. Despite these commonalities there are some interesting differences. O.R. is part of “hard systems thinking” (Jackson, 2019) occupying a position where it can serve problem contexts where there is no disagreement about objectives. Soft O.R., on the other hand, is the distant cousin of O.R., and proponents of the latter camp are suspicious about the rigour of PSMs (Ackermann, 2012; Ackermann et al, 2020). Similarly, Jackson (1990), suggests that the wider O.R. community (not necessarily Soft-OR advocates) are somewhat sceptical of the systems community's penchant for theorising; some see it as "impractical" (Jackson, 1990, p. 525). Critical systems thinking emphasises the importance of theory, soft OR tends to find out “what works, and what does not”, keeping “theory in perspective” (Ormerod, 2011, p. 245; Ormerod, 2016). But despite these differences, there are many commonalities between the softer, structural and emancipatory approaches comprising critical systems thinking and the approaches collected under the banner of soft OR. Some of the relationships between these labels, ideas and theory are captured in

Figure 2-1.

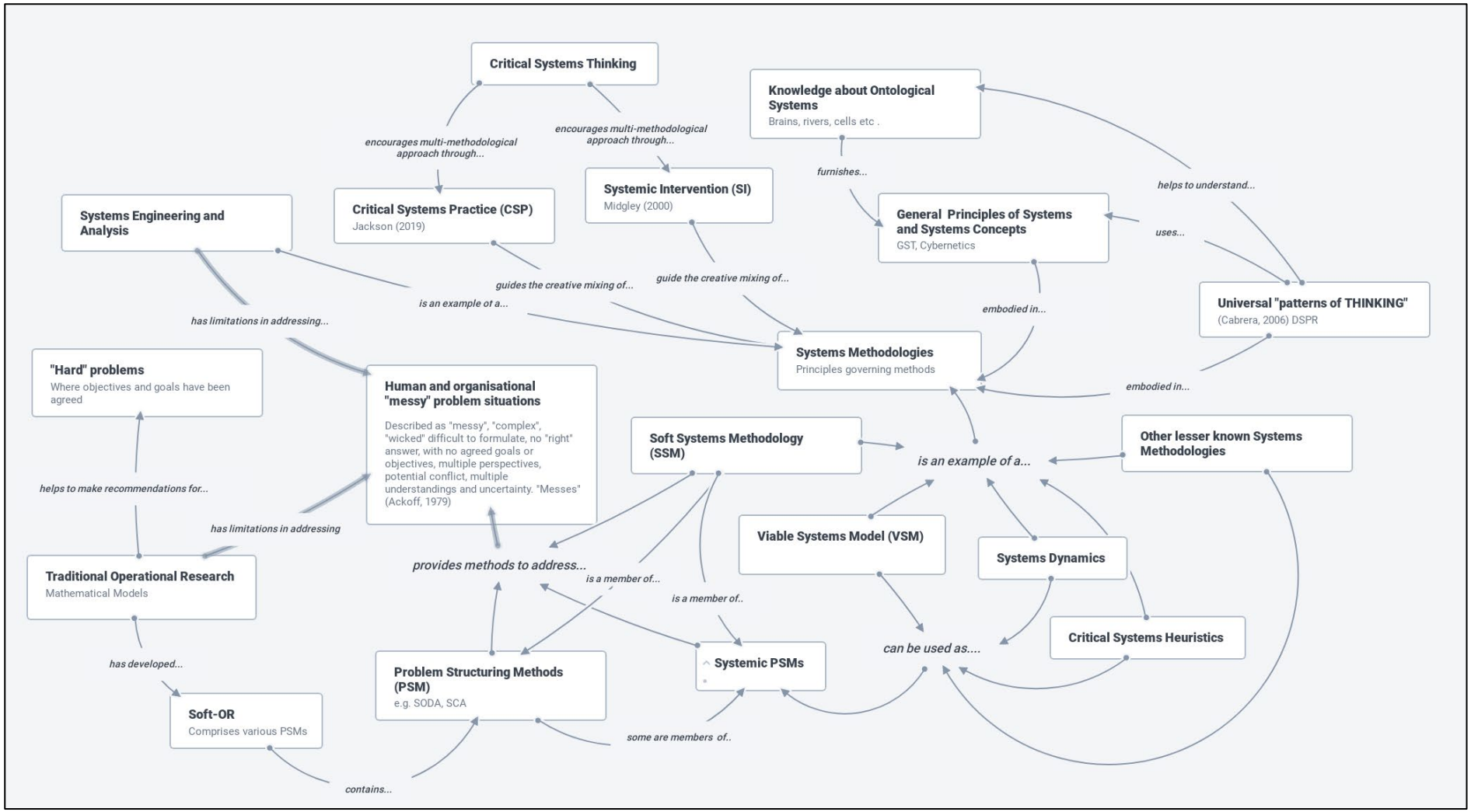


Figure 2-1 Systemic PSMs in Context

With the similarities and differences between CST/CSP and soft OR explained, sections 2.5 (Soft OR) and 2.7 (CST/CSP) provide an overview of these two broad communities. Section 2.6 is devoted to SSM, marking its inclusion in both camps.

2.5. Soft-O.R.

The aim of Rosenhead's (1989) edited book *Rational Analysis for a Problematical World*, and its second edition, Rosenhead and Mingers (2001), was to bring together a set of methodologies and methods that were developed independently but share some common characteristics and a common interest in helping analysts, consultants, and managers to tackle messy, complex problems. These became known as Soft-OR and forty years on from this landmark publication, three out of the five approaches outlined in the book continue to “dominate written literature on PSMs” (Smith & Shaw, 2019). They are regarded as “fully fleshed, proved and tested methodologies” (Paucar-Caceres, 2010, p.48): the Strategic Choice Approach (SCA), Strategic Options Development & Analysis (SODA) and Soft Systems Methodology (SSM). The first two approaches are discussed as one in this section, which focuses on the value of these two approaches, the level of expertise required to use them, and their distinctiveness/identity. (These are the three themes from Table 2-1). SSM, as mentioned above, is discussed separately in section 2.6 because of its sustained impact on management science literature (Mingers, 2000; 2011; Smith & Shaw, 2019).

The account here assumes that the reader has some knowledge of SODA and SCA, but for more information the reader should consult Appendix A and Appendix B. The appendices serve several purposes. First, they contain a description of the essence of each systemic PSM, with critical commentary on the contribution that each approach makes to systems practice. Secondly, and with the newcomer in mind, the appendices signpost the interested reader to definitive accounts of each systems approach.

2.5.1. The Value of Soft-OR

The question of how to evaluate the effectiveness of PSMs is a long-standing area of interest (Checkland & Scholes 1990; Eden, 1995; White, 2006; Midgley et al, 2013; Tully et al, 2019). For some, the question “do PSMs work?” is *undecidable* (Checkland & Scholes, 1990, emphasis added). All problem situations are different; there are different participants; different people managing the intervention, with variable levels of skill and competence in PSM. How can it be possible to compare one intervention with another? There are different contexts, different purposes for intervention, and different understandings of methodology and methods. Faced with these difficulties, there is a tendency for PSM researchers to personally vouch for the success of an intervention using single case studies (Midgley et al, 2013). Approaches are often described as “powerful” by the users and by case writers. Ackermann (2012) acknowledges that “some of the claims Soft-OR proponents make are often too sweeping” (Ackermann, 2012, p. 656).

Nonetheless, both SCA and SODA have accumulated a vast amount of evidence from a diverse range of applications. Ackermann (2012) provides a summary of some the benefits in favour of Soft OR. SCA and SODA both claim to manage complexity rather than “reduce it” (Ackermann, 2012, p. 654). They both advocate a form of holism (Smith and Shaw, 2019), despite Friend & Hickling’s (2005) reservations on this point. For SCA, the whole is a set of decision areas, links, comparison schema, uncertainty classes and actions; for SODA, it is a concept system, showing a causal logic map for an individual or a group. Both approaches encourage multiple perspectives, which is a means to being comprehensive; both help to create multiple options. Because SCA is an inductive theory, it creates easily accessible concepts, which managers naturally have little difficulty in adopting. But the language of SCA has other benefits too, with “people of quite diverse backgrounds [making] solid progress towards decisions, based on shared understandings with little or no explicit agreement at a more philosophical level” (Friend & Hickling, 2005, p. 5). Likewise, with SODA, mutual understanding increases as different perspectives are captured on one large interactive map. Individual contributions are “decoupled” from the contributor, so that each can be taken “on its own merit” (Ackermann, 2012, p. 655). Both approaches are highly productive; concepts

are rapidly generated in SODA, and a sense of urgency and progress is integral to SCA.

Despite the endorsements of originators and acolytes, Ackermann et al (2020) note that there are difficulties in getting acceptance by the wider OR community. Because the methods do not provide a “single right answer”, they “can be difficult to sell to organisations” (Ackermann, 2012, p. 656.). The methods are seen to lack rigour. Because they are open to lay participants, Soft OR methods are seen as less sophisticated and less “valuable” than hard OR approaches (Hindle, 2011).

Questions about effectiveness and value inevitably have to tread the fine line between validity for users/managers and validity for the purposes of scientific knowledge. Again, this is a question of mode 1 and mode 2 research. The latest efforts lean towards academic concerns, but pragmatic attitudes are always in the background (Checkland & Scholes, 1990; Zhu, 2011; Jackson, 2019; Tully et al, 2019). Calls have been made to run quasi-experiments, comparing PSM with other interventions (or no intervention) (Joldersma & Roelofs, 2004), but these hardly address the objection that every human situation is unique (Checkland, 1981). Midgley et al (2013) recognise the merit in a balance of both interpretive and positivist approaches to evaluation and propose a framework that takes into account four foci: the methods used, the context of application, the underlying purposes of the intervention, and its outcomes. The main argument is that proper evaluation cannot ignore the *purpose* of the intervention. In some cases, the purpose might be to simply define and frame a problem, in other circumstances it might be to seek accommodations in highly politicised systems. Reflection on the four foci can be done by those involved, by stakeholders and by other researchers. Alongside this, a survey instrument is used to assess the perceptions of the intervention and its outcomes according to stakeholders.

Tully, White & Yearworth (2019) begin from different assumptions. They see PSMs in a *consultancy* context and take seriously and literally the point raised by Morrill (2007) about “whether the benefits of PSMs [are] being *sold* sufficiently” (Morrill, 2007., emphasis added). Tully *et al* (2019) see the use of PSM in a commercial context. The consultant has to negotiate with the client

that a PSM is necessary and beneficial for an assignment. Following Callon (1984), the negotiation is achieved through a process of translation which involves “problematisation, interessement and enrolment” (Tully *et al,* 2019). They re-interpret value as the “competence of the consultancy organisation to deliver value *regardless of transformation enacted by the PSM intervention and the outcomes it leads to* (within reasonable bounds)” (Tully *et al.,* p. 429, emphasis as in original). How and why PSMs get used can’t be understood in “purely theoretical” or “purely empirical terms” (Tully *et al.,* p. 429). There is an attempt to put these aspects together in the period leading up to the “contractual” appointment of the consultant. This theoretical context opens up new possibilities for studying how PSMs and other methods might be adopted or resisted. The consequences for practising managers who want to “take away” systemic PSM to use in their own organisations may well face similar issues to the above. By implication they too need to create the recognition of problematisation and interessement, leading to enrolment. Each time a researcher/practitioner confronts a new situation and a new client, the researcher/practitioner faces the same obstacle, namely trying to convince would-be clients of the benefits of PSM (Morrill, 2007).

2.5.2. The Role of Expertise in Soft-OR

Appendix A and Appendix B point to some understanding of how demanding some of the soft-OR methods are, especially in respect of facilitation, and managing both process and content (Ackermann et al, 2020). Eden and Ackermann (1998) of course emphasise this by claiming that their “Journey Making” methodology and SODA method looks “deceptively easy” to employ. A plausible explanation for the lack of take-up by practitioners of systemic PSM then, is that there are insufficient “experts” to transmit or carry the ideas and methods to new contexts. The significance of *expertise* in the *process* of systemic intervention, or PSM usage, has been a key concern in the work of Paul Keys (2006; 2007b; and 2007c). The special issue on PSM, in the Journal of the Operational Research Society (Franco, Shaw & Westcombe, 2007), also drew attention to the relative seniority of leading authors in the PSM field, expressing concern about who would succeed them. Rosenhead (2006) talks of a limited base of skilled [PSM] practitioners. He considers “apprenticeship-based growth” as slow, and a “threat” to greater PSM adoption. But it is Keys’

(2006) work that theorises the importance of *becoming* expert in PSM which has significant consequences for theory and practice.

The importance of Keys' (2006) work is twofold. First, he argues that application of systemic PSM is not quite as simple as picking up a method from the shelf and applying it to the situation at hand, much as we would pick up a recipe to make a meal. Secondly, by positioning systems practice or PSM usage within the context of actor-network-theory, an argument emerges which says that adoption, or at the very least successful implementation of practice, is far more difficult to achieve than one might at first imagine. Understanding the *process* of OR, or the *process* of PSM is Key's central theme (Keys, 2007b). What is it that analysts, or users of PSMs, are doing when they perform an intervention? In one sense, Keys urges us to consider that the user is both producing and using knowledge; producing knowledge as a result of the intervention, with all its context, and using generic knowledge of PSM which is helpful and "prescriptive" for users of PSM (novice or expert). The implication of this is that obstacles to further PSM penetration or adoption may be overcome, to some extent, if we better understand the *process* of PSM usage. But one must also question whether the actual method(s) being deployed, and the theory which underpin it, are sufficiently difficult and nuanced for professional managers to question their ability to adequately adopt the methods. A second difficulty is the primacy that Keys and others appear to give to the notion of expertise being essentially a commodity of the problem solver, usually an outside agent, who has come into the management situation. If PSMs are used as take-aways, admittedly in a novice form, the practising manager needs to worry less about content and more about process.

2.5.3. Identity and Distinctiveness of Soft-OR

What makes SODA and SCA distinctive? How are they different to "traditional" management approaches? Friend & Hickling (2005) accept that SCA as an "open technology", which encourages a greater "orientation" to participation, and learning, and aims to produce incremental progress – characteristics equally valued by SODA – are hardly exclusive to PSM. Numerous organisations espouse values of involvement, engagement, learning etc.

However, despite organisational pronouncements “it has proved far from easy for people to give effect to such changes in orientation in practice” (Friend & Hickling, 2005, p.72). Friend & Hickling realise that some people become cynical about such efforts; they see this as a challenge to be overcome by providing practical guidelines or “how-to” advice on how to avoid backsliding to business-as-usual.

A recent effort to harmonise Soft OR is Smith & Shaw (2019), who establish 13 questions organised in 4 pillars based on “systems characteristics”, “knowledge and involvement of stakeholders”, “the values of model building”, and “structured analysis”. The questions are created to maintain the integrity of the PSM label and to throw out any imposters. SCA, SODA and SSM pass the 13 tests, but this is unsurprising because they are part of the literature review which helped to develop the questions (the authors recognise the circularity of their argument). However, if multimethodology (MM), discussed later in this chapter (see section 2.8), is now widely accepted as the norm in practice and theory and Midgley et al., 2017), the need for a common framework and its actual use seems debatable. Some of Smith & Shaw’s (2019) “pillars” are less contentious than others. All PSMs build models which are seen as transitional objects on the journey to making actions and improving understanding. These models have some standards, and some degree of rigour is required in their construction. Their status as “devices” has important consequences for thinking about problem situations. The qualities of the modelling approach arguably set PSMs apart from other management ideas and methods.

According to Smith & Shaw (2019), a central characteristic of PSMs is that they model a systems concept, a “whole” entity. As suggested above, the creators of SCA may have some difficulty with this claim. Moreover, some attempts of conceptualising the idea of system are better than others. In the next section, this idea of conceptualising a system becomes much clearer owing to the unique strengths of SSM. SSM is part of the PSM family, but its intellectual roots are unquestionably in the systems camp.

2.6. Soft Systems Methodology (SSM)

In 1981, Peter Checkland, one of the key originators of Soft Systems Methodology (SSM), considered the subject of *systems* relatively new. He estimated it was around 30 years old. But he envisaged "a long and active life" for the subject (Checkland, 1981, p. 4). Its concern was the abstract idea of "organised complexity", and its method, for most of its life up to 1981, had been systems engineering (SE), or systems analysis (SA). It had been very successful in designing technical systems. But in the 1970s, Checkland was part of an action research project that examined the application of SE to general management problems and had found it wanting. It seemed that human systems are different. By 1981, Checkland was ready to present a new methodology to the systems discipline, his version of SSM. He was right about the subject systems having a long and active life, and his work has stood the test of time, but the extent to which it has influenced the management field is still a matter for debate.

This section is structured in the same manner as section 2.5 and the interested reader is invited to consult Appendix C for an introduction to the core ideas of SSM.

2.6.1. The Value of Soft Systems Methodology

Checkland & Scholes (1990) attitude to "Does SSM work?" has already been referred to. Their position is clear: the value of SSM can only be judged against the accumulated experience of many projects. These, on the whole, are judged to be a "success". In the academic community, SSM is held in high regard (Mingers, 2000; 2011), and practitioners like Wilson & Van Haperen (2015) run successful consultancy businesses using SSM as their main approach.

The most significant aspects of the methodology are arguably the "below-the-line" thinking – *the systems thinking* – that occurs in stages 3 and 4. SSM is thought to be strong for analysis and appraisal (Mingers, 1997b). Of course, it is somewhat trite to single out these aspects in a reductionist manner, and in many ways it goes against the wishes of Checkland and others who have tended to play down these features because of their dualist connotation and the possibility that this part of the methodology requires professional expertise

(Tsouvalis & Checkland, 1996) But this distinction is vital, because it encourages users to contemplate relevant notional systems, which can range from relatively modest primary task models to radical models more likely to create interesting debate. But, as mentioned above (and in Appendix C), the (creative) naming and construction of notional systems is perhaps the hardest part of the methodology to learn, given users' preference to create models which "describe" reality, together with the tendency – because of education and training – for users to want to validate those models.

So, the *value* of SSM comes with a cost. On the one hand users of the approach have emphasised that naming relevant systems and building conceptual models is "the most *imaginative* step taken by an analyst using SSM" (Woodburn, 1985 quoted in Checkland and Tsouvalis, 1997, emphasis as in original) and requires "a *profound* skill" (Woodburn, 1985). There is also an unresolved tension, as Checkland warns users from labouring stages 3 and 4 (Tsouvalis & Checkland, 1996). Very little time is spent in "below the line work", a good example of this is Checkland & Brown's study (see Checkland, 1984), evaluating past events for a small management consultancy where "the systems thinking involved only occupied half a day of the four weeks". Wilson's (2001) account of a typical schedule for developing proposals for a client suggests that slightly more time is spent developing RDs and CMs than in the "finding out" stages, but more time is devoted to the comparison and deciding action stages. Overall, the time taken "above the line" is greater than the time taken for activities "below the line", but in Wilson's hands, the time distribution seems more in keeping with Woodburn's emphasis on the importance of activities 3 and 4. Of course, this argument can be rebutted by saying that acts of imagination (stage 3), by their very nature tend to be quick and spontaneous, but I would argue that the tension remains because it is not uncommon for the work in stages 3 and 4 to be done by the analyst/consultant. An example of this is Checkland & Poulter's (2006) study in creating an information strategy for the Royal Victoria Infirmary (RVI) in Newcastle, UK. Citing a tight timescale and lack of methodological understanding (unsurprising) among the wide-ranging participants (at the hospital), it was agreed that Checkland would produce some initial models for others to comment on. Taking the naming of relevant systems and model building "offline" is a regular feature of SSM work described in the

literature. Notwithstanding the claims of wanting to “give away” the methodology to users (Checkland & Scholes, 1990; Brocklesby, 2007), some expertise is required to do the “systems thinking”. The object of stages 3 and 4 are, in Checkland’s words “to lift thinking in the situation out of its normal, unnoticed, comfortable grooves” (Checkland, 1999, p.A22). In summary, stages 3 and 4 of the methodology appear to offer substantial value to practising managers, but significant expertise may be required, anticipating the discussion in 2.6.2.

The critique of SSM has been well documented. The main argument made by writers like Jackson (1982), and Mingers (2000), is that SSM studies could only lead to modest, incremental changes in organisations. Jackson felt that any debate between users of the approach, typically at stages 5 to 7 of the learning cycle, would be unduly influenced by powerful stakeholders. Checkland’s response is that “there are no restrictions on what can be achieved in principle” (Mingers, 2000). The effect of Jackson’s (1982) critique has compelled others to develop emancipatory systems approaches, for example, critical systems heuristics (Ulrich, 1983). Bergvall-Kareborn (2002; 2006) suggests that the ideal of open and participatory debate, unconstrained by the interests of the powerful stakeholders is an *exceptional* standard to achieve. We must work with what we have, and seek ways of complementing conservative uses of the methodology with non-traditional ways of thinking.

But other criticisms can be levelled at SSM. Like the Soft-OR approaches, SSM makes implicit field assumptions: managers are people trying to act purposefully, which on the face of it seems a perfectly reasonable assumption. But if they are not using a structured approach in their thinking and acting - be it a systems approach or any other organised approach - they are “thrashing around”, according to Checkland. This more casual phrase, deployed by Checkland on multiple occasions, is used to describe his experience of organisational life. Again, this observation may seem perfectly reasonable, but an alternative assumption would have it that people can live with, tolerate, and actively encourage ambiguity and poor structure in order to pursue their personal agendas, or indeed, for reasons that are not so transparent. The manager who tries earnestly to make sense of a complex situation by providing some structure, or by developing a simple model of the situation, quickly

becomes frustrated by those who do not share his or her vision, or only partly share it.

2.6.2. The Role of Expertise in Soft Systems Methodology

Various aspects of the expertise required to use SSM have already been referred to in the last section and in section 2.5.2. Another way of surfacing issues about the level of expertise and craft skills required to be a reasonably competent practitioner, is to examine the observations made by Checkland on the "secondary literature" of SSM. Users struggle to name relevant systems in the recommended format, often mistaking the inputs that are transformed by the notional system with the resources that facilitate the transformation (Checkland, 1999; Checkland & Scholes, 1990). Checkland (1990) asserts that the ideas are not "abstruse", but even so, "errors recur, time and time again" (Checkland, 1999, p. A22). Sometimes users are "frozen" in the conceptual model stage, wanting to validate their output. Models can only be "validated" against the RD, because they are conceptual holons. Sometimes users use verbs for the "thing" that gets transformed. This should be an entity, concrete or abstract. Transformation is not the same as causality (Georgiou, 2012). Some individuals appear to be more adept at SSM than others. There is a need for abstract thinking, as referred to above. Hindle (2011) and others have recognised that adequate learning of the approaches may be a barrier to further acceptance and proposes new ways of teaching the approach. Checkland & Scholes (1990) believe that if users can grasp the epistemology, using SSM is "natural", (Checkland & Scholes, 1990, p.300).

2.6.3. Identity and Distinctiveness of Soft Systems Methodology

Checkland & Scholes (1990) drew attention to the varieties in which SSM can be used, outlining mode 1 and mode 2 use (described in the appendices). At this time (1990), they wanted to avoid being too prescriptive, but also wanted to distinguish bona fide or legitimate SSM use, from non-SSM use. Moreover, by building "constitutive rules", following Naughton (1977), guardians of SSM could now "mark the work" of others, in their attempt to make defendable applications of the proprietary methodology.

It is questionable whether the move away from the 7-stage cycle of SSM, as presented in the 1980s version of the approach, has helped or hindered its overall identity and its distinctiveness as a methodology. Have the refinements to SSM helped to further differentiate it from rival methodologies that may pre-occupy management thought, or has SSM become more like those rival approaches? The justification for refinements to SSM is grounded in multiple action-research projects. Each project tackles a real-world problem leading to action to improve the situation, and at the same time the researcher "enters the situation having a declared framework of ideas and methodology" (Checkland & Holwell, 1998). Because the framework of ideas and methodology is declared in advance, then it becomes possible and legitimate to reflect on those very same ideas during and after the intervention. This taking-part-in-the-action produces findings that justify further refinement of the methodology. Viewed in this way, changes to SSM are part of a continuous research cycle. However, when reading the history of SSM development, it is not too difficult to find changes which are driven by a logic of positioning in relation to other methodologies. For example, reflecting on his earliest account of SSM, Checkland detects a "whiff of systems engineering" (Checkland, 2011, p.503 quoted in Jackson, 2019, p.412). Wherever possible, SSM distances itself from any language that might erode its reputation as a methodology that models users' subjective interpretation of the world.

The idea of constitutive rules (CR) which describe whether an approach is SSM or not, are vitally important for research purposes. It allows discrimination of SSM from non-SSM, permitting researchers to compare methodologies and detect their usage. Checkland & Scholes recognise that there will be "family resemblances"; it is not a straightjacket. The concept has been taken up by Yearworth & White (2014) in respect of CR for PSM, and Jackson (2019) in respect of CR for generic systems methodologies. The former's work is important because with an updated (and agreed) set of CRs, it becomes possible to empirically assess non-codified uses of PSM. One irony, however, is that as more methodology is "internalised" and more still is combined with other methodologies, it escapes external examination (Checkland & Scholes, 1990, p. 286)

There is a quandary here for the champions of systems thinking: Do we make systems methodology so flexible that it blurs methodology to such an extent that the ‘systems approach’ becomes indistinguishable from other methodological approaches? One solution to this quandary may be to keep systems methodologies relatively self-contained, to maintain their identity and coherence in accordance with situations they are most suited to, mixing them with others when the situation demands. This is what critical systems practice (CSP) tries to do, and this is the subject of the next section.

2.7. Critical Systems Thinking and Practice

If the thirty-years from the early 1970s to the early 2000s was a period characterised by efforts to establish, develop and refine a systems methodology capable of addressing soft, ill-structured real-world problems, then the overlapping period, 1980 until the present, was all about how to best manage a growing number of systems methodologies, and how to put these to work in the right context, using their strengths to the best effect. This period of systems research led to the emergence of critical systems thinking and practice.

Critical systems thinking (CST) builds on the work of others. It recognises the strengths and weaknesses of other systems methodologies, it advocates multi-methodology and the mixing of methods to improve intervention success. To do it justice there will be a need to discuss three variants of how to operationalise critical systems thinking (CST) including:

- Jackson’s Critical Systems Practice.
- Midgley’s Systemic Intervention.
- Mingers’ multi-paradigm, multi-methodology (or Critical Pluralism).

There is also a need to briefly discuss some individual systems approaches in this section including the viable systems model (VSM), systems dynamics, and critical systems heuristics (CSH). These are *independent,* self-contained systems methodologies (just like SSM), all of which were developed before the widescale acceptance of multi-methodologies. They may be used independently as part of a multi-methodological intervention or combined with other approaches as part of an intervention. One reason for their inclusion under

CST/CSP is that they illustrate multi-methodology. But this is not to under-value them in anyway, they can, and are, used independently in their own right.

Critical systems thinking and practice grew out of a nuanced and critical understanding of the strengths and weaknesses of individual systems approaches. Jackson and Keys (1984) and Jackson (1990) have led the way in this. The latter's books (Jackson, 1992; 2000; 2003; 2019) provide a range of social theories and other instruments – working at various levels – to reveal the tendencies, assumptions, orientations, and pre-suppositions of various systems methodologies. These include an anthropology of knowledge (Habermas' theory of knowledge-constitutive interests, 1972); sociological paradigms (Burrell and Morgan, 1979); metaphorical images of organisation (Morgan, 1997); and debates about modernism and postmodernism. The research led to a much greater understanding of various systems methodologies, their potential reach for would-be users, and their appropriateness in specific problem contexts. For Jackson (2019):

> It became apparent that all systems methodologies however useful they appeared, especially to their advocates, had their limitations and that these were closely related to the particular social theory that a methodology embraced, either explicitly or implicitly. (2019, p. 518)

Jackson pursues this research strategy on the basis that social sciences are "strong on theory", while systems thinking "can assist in the task of translating the findings of social theory into a practical form…for bringing about change" (Jackson, 2019, p. 517). The strategy has been described by Jackson (2019) as "metatheorizing" (after Edwards, 2014), and has also been justified using Luhmann's (2012) working through of von Foerster's (1984) second order cybernetics, or the cybernetics of observing systems. Each of us occupies a paradigmatic position, which we may share with other researchers, but we are able to observe the methods, the methodology and the philosophical assumptions of other (alien) paradigms, even though this is through our own paradigmatic lens.

Jackson's strategy is to call on "relevant social theory", but to do this he requires a meta-theoretical framework; something perhaps more refined than Burrell & Morgan's framework, and something that takes into account that "systems methodologies are designed to conduct Mode 2 type interventions" (Jackson, 2019, p. 155). The framework must be "capable of bridging the gap between social theory and the action orientation of systems methodologies" (Jackson, 2019, p. 155). This work culminated in a well-known framework – the system of systems methodologies (SOSM) (Jackson & Keys, 1984), which allows researchers and practitioners to locate individual methodologies on a grid made from two dimensions: the degree of systems complexity (1) and decision makers' perspectives (later stakeholders' perspectives) (2) (see Table 2-2). This grid represents "ideal" problem types in the Weberian sense; it is not to be read as a representative scheme which exhausts all problem types that might be experienced. It is merely a way of thinking about how two dimensions – the degree of systems complexity, and the degree of agreement among participants – can *interact,* giving rise to nine problem contexts. For Jackson, the *interaction* is effectively an entanglement of technical complexity, people complexity, organisational complexity etc. (Jackson, 2019, p.159).

	Unitary	Pluralist	Coercive
Complex			
Complicated			
Simple			

Table 2-2 A system of systems methodologies (after Jackson, 2019, p.164)

Several adjustments have been made to the SOSM over the years, and this account shows the most up to date version (Jackson, 2019). The vertical axis considers systems and their complexity. Here we are in the realm of the more abstract subjects in systems theory, the general principles that underlie viewing phenomena as systems and their properties. Boulding's (1956) hierarchy of systems and Beer's (1967) classification of systems helps to inform this dimension of the SOSM, and further supports Jackson's insistence that the framework identifies "ideal type" problem contexts. Simple systems can be

expected to have fewer parts; the interaction of the parts will be determined in mechanistic ways and will not change much over time. In more complex systems there will be very many parts and sub-systems, interaction will not be pre-determined, the structure of the system will influence behaviour, the parts may independently affect the evolution of the system, and the system will be subject to a highly turbulent environment. Complicated systems differ from simple systems in that causal relationships between parts (where they exist) will be non-linear and there is likely to be delays between cause and effect. The addition of this refinement to the SOSM permits Jackson (2019) to make finer judgements of where particular systems methodologies carry assumptions about problem contexts. The horizontal axis measures the degree of agreement between participants (stakeholders) found in the ideal-type problem contexts. Situations arise where there are perceived high levels of agreement about values and interests. Goals can be realised relatively easily because of common values and ideas. These contexts are described as “unitary”. A “pluralist” context envisages some disagreement, and constructive conflict amongst those involved in the situation. Reaching agreement, or accommodation as Checkland (1981) would have it (see above), is deemed to be possible without recourse to coercive methods. Those involved in the situation will have different aims and will have different views on how to achieve those aims, but they are happy to articulate these views openly, in an unconstrained manner. A coercive situation arises where there is no or very little agreement, even hostility among those involved. There is a recognition that the seemingly unfair power, or unfair access to resources or position, will be required for action to proceed. Jackson follows Freeman’s (2010) ideas about stakeholders to ensure that users of the SOSM are cognisant of the fact that the idea includes those who are affected by a system design, and those who can affect the systems design (Mitroff & Linstone, 1993, quoted in Jackson, 2019, p.163).

As a consequence, the interaction of the relative complexity of the situation (system to be managed) and the perceived degree of agreement between those involved or affected by the situation produces nine different problem contexts, which provides Jackson with a vehicle to study numerous systems methodologies and pronounce judgement on each, as regards its suitability for

the perceived problem context. It also allows him to chart the historical development of systems methodology, as successive researchers try to stretch the original formulas into new domains and territories with various degrees of success. Jackson's point is that we can avoid failure, if we are *critically* aware of the assumptions that enter each systems methodology, and we can develop a sound awareness of the strengths and limitations of each approach.

Jackson's (2019) work leads to an inevitable conclusion. If we are to be successful in systems thinking and practice, if we are to cope with the diversity of problem contexts, then we need to take a multi-methodological approach to intervention. His version of this is called critical systems practice (CSP) which will be reviewed below.

Before this can happen, however, some space here and in the appendices is required to discuss several single paradigm methodologies including:

- Organisational cybernetics – the Viable Systems Model (see also **Appendix D**).
- Systems Dynamics – Causal Loop Diagramming (see also **Appendix E**).
- Critical Systems Heuristics (see also **Appendix F**)

This is a selective list, especially since Jackson devotes space to ten separate methodologies. So, some justification is in order. First, space dictates that not all methodologies can be reviewed. In any case the reader can turn to Jackson (2019) and other texts to learn more about the methodologies I have excluded. Secondly, my aim is different to Jackson's. This thesis is about systems thinking and systemic PSM for the *uninitiated*. A dictionary definition indicates that the uninitiated are those that lack special knowledge or experience of something. In the methodology section, and in the case studies which follow, I will have more to say about the uninitiated. For now it is enough to say that I do not possess *special* knowledge of all the methodologies classified in the SOSM. Numerous authors writing in the management sciences and elsewhere, have commented that researchers and practitioners cannot be expected to know several methodologies and their associated methods (Mingers & Brocklesby, 1996; Midgley et al, 2017). There are "cognitive limitations" (Mingers & Brocklesby, 1996). This is not to say that this is the only reason for focusing on the three

methodologies listed above. They are selected because the demands they place on users - in respect of learning specialist techniques etc. - is not excessive. In this sense they are relatively low-level technologies. The methodology for each approach is relatively sophisticated; the methods or tools marshalled by each methodology less so. For this reason, it is tentatively suggested that they are within the grasp of practising managers. Such approaches are freely given to interested parties, willing to put a modicum of effort into understanding the theory, methodology and methods of selected approaches. One exception to this argument may well be Systems Dynamics (SD). Sweeney & Sterman (2000) and Warren (2004) have all been surprised by users' lack of ability to interpret stocks and flow diagrams and their associated accumulations. Because of this I have excluded the "harder", quantitative aspects of the SD methodology, drawing attention to the "softer", more interpretive aspect of causal loop diagramming. This is an example of "partitioning methodologies", something advocated by Midgley (1989) and referred to later in section 2.8. For the VSM and CSH, on the other hand the respective methodologies are relatively unsophisticated and well within the reach of professional managers (Hoverstadt and Loh (2017) - in relation to VSM).

This selection process is highlighted in Table 2-3 below which shows all ten systems methodologies which make up Jackson's (2019) SOSM.

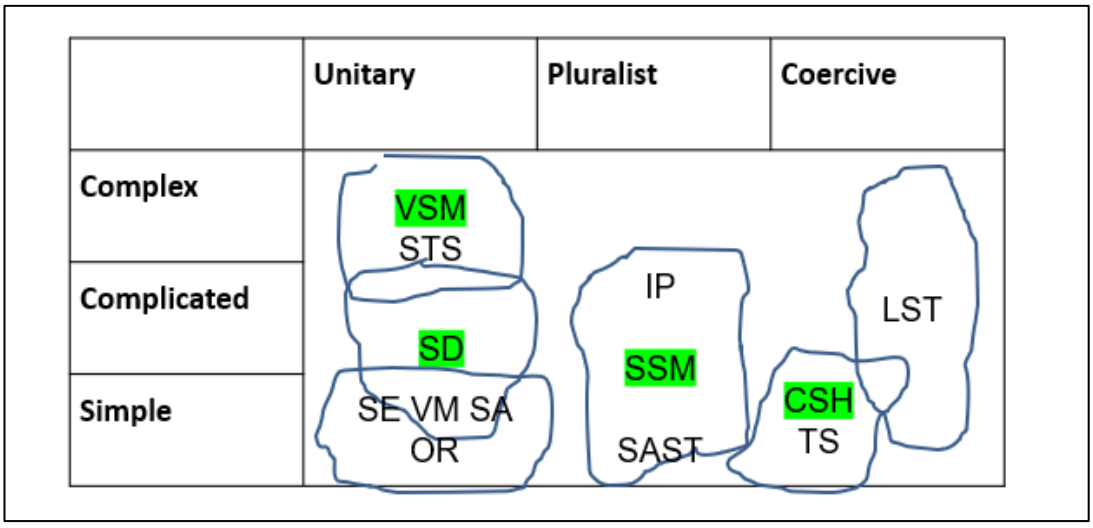


Table 2-3 SOSM adapted from Jackson (2019)

It is noticeable from Table 2-3 above, that the single methodologies referred to in this thesis cover a reasonable range of the ideal-type problem contexts

identified by Jackson. There will be, however, little coverage of the unitary/simple problem context. Jackson associates this type of problem-context with systems engineering, systems analysis, operational research etc. I would argue that the management sciences have been so productive in creating methodology and methods to serve this dimension of problem solving, that there is little new to be gained from asking how the uninitiated relate to this type of hard methodology and its many techniques. Proponents of specialist techniques like multiple-criteria decision making (MCDM), analytical hierarchy process (AHP) (Saaty, 1990), discrete event simulation (Robinson, 2014) and countless others may lament that managers do not take up these methods in greater alacrity, arguing that they will improve the efficiency and effectiveness of decisions, but it is more difficult to argue that those being served have not been initiated to the core aspects of this "hard" methodology – e.g. formulate the problem, establish objectives, create a mathematical model, test the model, compute sensitivities etc. – and its variants. An example would be the many forms of project management methodology that organisations habitually adopt. These are derivatives of hard systems approaches, philosophically and methodologically. They are hardly alien to experienced managers.

Having set out reasons for selecting certain methodologies, I will now turn to their description within the context of the three themes, following the same format which was used in sections 2.5 and 2.6.

2.7.1. The Viable Systems Model (VSM)

For an account of the VSM the interested reader is invited to consult **Appendix D.**

2.7.1.1. The Value of the Viable Systems Model

It would be very easy to dismiss the VSM as irrelevant and outdated in our modern digital age (Jackson, 2019). While this is a reasonable objection it is also mis-guided:

> "…although technology marches on, the cybernetic principles underpinning effective organisation remain the same. Beer's VSM captures those principles in a model of great generality that can be

> employed to understand and re-design all types of system" (Jackson, 2019, p. 325)

It would be understandable to pass over some of Beer's highly original ideas, on the basis that they pre-date the internet, but I would have to concur with Jackson, it is the *generality* of the ideas that are important. Beer's idea of the "algedonic meter", for example, remains highly relevant today, especially in its potential to provide real-time measurement of things like employee morale or employee satisfaction. Most organisations use employee surveys as a means of gauging morale (Bowles & Cooper, 2010) and do so annually, or at longer intervals. Such surveys immediately fall foul of Beer's tests to ensure that requisite variety and enough feedback are built into the system. First, surveys do not work in real-time, the results are usually compiled and presented at a much later employee engagement event, making them out-of-date. Secondly, respondents are asked to answer questions which they wish had not been asked. By contrast a simple "algedonic meter" expressing satisfaction on a simple scale of 1 to 100 would provide a general and real-time indication of aggregate employee morale across the organisation. Timeseries could be displayed, and Beer would no doubt be likely to insist that an aggregate meter is put in a reception area for everyone to take account of. A second example to support its relevance is the perennial debates that people have about centralisation and decentralisation. The VSM offers a language to better understand autonomy and control, so that decisions can be made which take into account what is generally perceived to be a modern preoccupation of management, namely managing complexity. Reading the VSM, managers can work their experience into the language of complexity and into a different narrative. VSM advocates would argue that practitioners will get new insights from applying the model. They would also refer to numerous successful case studies, as typified by Mulej & Schwaninger (2006) (see Appendix D). Beer discusses his own experience of using the VSM, pointing out that "remunerated consultancy should not be taken lightly". There has also been some survey work to evaluate the success or otherwise of the VSM (Schwaninger and Scheef, 2016, cited by Jackson, 2019). The results show that the VSM is a "reliable device", but the authors do not claim that the survey is definitive.

Against these positive noises, there is also plenty of criticism. Some commentators have expressed concern that there is too much focus on structure and not enough on people (Ulrich, 1983); some managers think the ideas are “utopian” and “overly prescriptive” (Jackson, 2019); others point to the naivety of expecting participants to agree on the recursive structures and primary operations in the face of over-whelming complexities of the environment. Indeed, if Luhmann’s (2012) theory of society is considered, with its highly differentiated function systems producing society according to its own logic, then it seems highly unlikely that people will agree on “mapping the system”.

2.7.1.2. The role of expertise in applying the VSM

Turning now to the role of expertise in applying the VSM. The early language to describe the VSM was intimidating for most managers. Beer recognised this and simplified his presentation in his later books (see *Diagnosing the System for Organisations* (1989)). The secondary literature contains numerous “real-world” examples which help to illustrate the ideas. Much of the *translated* versions of the theory can make intuitive sense to most managers, helping them to see ‘ordinary’, everyday objects – like management information, budgets, ERP systems etc. – in systems terms. Managers can see how these objects and processes help to serve viability. On the one hand, the methodology is simple (Hoverstadt, 2010), but in other places the secondary literature emphasises the scientific aspects of the approach. Jackson (2019) seems torn, “managers do not need expert help to master the approach” (Jackson, 2019, p.339) but “the VSM has many levels of sophistication” (p. 340). “Beer [himself] claimed that an experienced VSM practitioner could often walk into a factory and identify the major problems within a day or two and that, once pointed out, management would recognise the veracity of the judgement – such problems having already been subconsciously recognised and papered over” (Pickering, 2011 referring to Beer, 1981). But the question then becomes, how does one accumulate the experience?

2.7.1.3. The identity and distinctiveness of the VSM

The VSM philosophy, methodology and methods are self-contained. There is very little like it, making it easy to differentiate from other approaches. It stands in stark contrast to many well-worn organisational management ideas. Few would dispute its break from convention. It might be argued that Espejo and Reyes' (2011) work, in pushing the VSM in an "interpretive" direction, adds to the complexity in the literature. This affects the level of expertise required and the identity of the VSM. "A cybernetic loop" is now accompanied by a "learning loop". These arguably put greater demands on novice users. All ideas get extended. Espejo and Reye's (2011) work might be seen as a form of multi-methodology (see below). Alternatively, the mixing of interpretive and structural themes might hinder the identity of the VSM and hold back its further acceptance as a valuable contribution to management thinking.

2.7.2. Systems Dynamics (SD) – Causal Loop Diagrams (CLDs)

Following the pattern of previous sections, the literature on SD and CLD is extensive, so for an account of the CLDs the interested reader is invited to consult **Appendix E.** Here the focus is on the value of CLDs, the expertise required, and its distinctiveness as a method.

2.7.2.1. The Value of SD Causal Loop Diagrams

CLDs are valued because they can get managers to look beyond surface issues. Sweeney and Meadows (2010) use an iceberg metaphor to illustrate this point. Above the waterline are the events that managers can see and try to manage. But underneath the water are the patterns of behaviour and the structures that determine the observable behaviour. CLDs can be helpful in explaining how behaviour is manifested because of the interplay of different causal loops. They are helpful in highlighting unintended consequences and delays. They remind managers to look more deeply at causal relations, rather than just focusing on the surface issues.

Of course, the approach has its critics too. Jackson (2019) cites an example of a CLD which seeks to explain "Russian Society in Transition" with "29 variables" (Cavaleri & Obloj, cited in Jackson, 2019). He asks, "How can we possibly know

that these are significant variables…?" (Jackson, 2019, p. 251). It does seem more than possible, that models will lack credibility in the eyes of clients, especially when they attempt to address grand, sweeping issues. Advocates of SD do not seem to be put off by grand topics. Many of the textbooks (e.g., Sterman, 2000; Morecroft, 2015, etc.) use examples from urban planning systems, fisheries, road congestion and health. Perhaps SD is more at home with the bigger policy questions. This is both an asset and a potential flaw; an asset in the sense that many people associate systems thinking (a broad church) with systems dynamics, which tends to give the approach a high profile (especially in the USA) (Cabrera, 2006). It also makes sense for those pushing the systems thinking agenda, to work with the most senior decision makers, who happen to be dealing with the biggest issues. A good example of this is Rutter (2019), who works with the World Health Organisation and with the UK's NHS to reduce obesity. But there is a potential flaw pursuing the big policy issues, in the sense that the models may not be entirely credible to all of the many stakeholders involved in these big policy issues (Jackson, 2019). We can imagine how systems thinkers acting from an interpretive perspective might view this tendency for SD to create grand models requiring considerable technical and communicative expertise. We might also imagine how advocates of the Strategic Choice approach might view SD. Is it not more realistic, they may ask, to try to make some decisions now and defer others, rather than attempt to make a grand model? In this sense, SD overlooks some of the more human dimensions of problem solving.

SD advocates would hit back and say that the models are there to provide insights, learning, and to highlight potential points of leverage. It is up to policy makers to act on those insights. Lane, Munro & Husemann (2016) were successful in persuading senior civil servants to understand the "ripple effects" and unintended side effects of previous reforms to the child protection system. In this case, the requirement for expertise might be more *communicative* than *technical*. But this brings me to a final tentative criticism of the SD approach, and one that I admit requires more investigation. There seems to be some tendency to use SD as a means of studying past events. The above example (Munro, 2011) was a formal review; much of Senge's work (2014) talks of past events. Another feted example is "the speed trap" (Perlow et al, 2002). There is

an abundance of forward-looking models (see Jackson, 2019 for some examples), but these are often hotly disputed. Perhaps managers and policy makers don't want to know what they're doing wrong now but are happy to use SD to make sense of the past. This chimes with Ackoff's (2006) remark about the sins of omission.

2.7.2.2. The Role of Expertise in Causal Loop Diagramming

SD, for the most part, is an expert led approach. But this section has argued that the causal loop diagramming technique is a potential "take away" for managers who want to see the bigger picture. It will be used as one potential method of intervention in the case studies that follow.

2.7.2.3. The Identity and Distinctiveness of Causal Loop Diagramming

The methodology of SD is self-contained. SD has maintained its distinctiveness in relation to other methodologies, though there is some criticism by Lane (1999) and Jackson (2019) of developments that have taken SD in an "interpretive direction" (see for example Vennix, 1995). The danger, according to SD experts like Lane, is that the approach will lose its edge and its potential to make a contribution if it "[denies] the effectiveness of causal laws" (Lane, 1999, quoted in Jackson, 2019).

2.7.3. Critical Systems Heuristics

Up until this point, little has been said about the agents of intervention and how they are constituted, save for some reference to actors, customers and owners in SSM; *staff, managers, facilitators, clients, individuals* and *groups* in SODA and Strategic Choice etc. What has been evident is systems thinking and soft OR's general commitment to perspectivism, and to thinking about stakeholders, that more can be learned about systems and situations, if more agents are involved in the process, or more agents participate in the building of relevant models or artefacts, or more mental models are surfaced and debated (subject to practical limitations, of course). The point is best summed up in Churchman's often cited remark:

> The systems approach begins when first you see the world through the eyes of another. (1968, p. 231)

In other words, Churchman had in mind the idea that we should explore and understand individual human subjectivity in systems work. The more this can be done, he believed, the better our understanding of problems will be, because they attempt to take in the whole. But this is an unattainable ideal, because it is not practically possible to endlessly "sweep in" different perspectives to the "inquiring system" or, in the practising manager's language, the "intervention". Systems thinkers can never capture the whole, therefore, but the theoretical ideal is an important one because its counterpart is that we become conscious of the "inevitable lack" of comprehensiveness of any systems study. Practitioners may aim to be as comprehensive as possible but everything we do is selective. And herein lies one of the most important aspects of systems thinking for many writers (e.g., Cabrera, 2006; Churchman, 1971; Luhmann, 2018; Midgley, 2000; Ulrich, 1983): the importance of making *distinctions*. In the type of systems thinking which helps to inform practical intervention in problem situations, the language of *boundaries* is generally preferred to the language of *distinctions*, but both terms are broadly equivalent. In critical systems heuristics (CSH), the idea of *boundary* critique is used to interrogate the assumptions that managers, consultants, and others make in perceiving problem situations and proposing improvements. This includes assumptions that are made about the *agents* of intervention, and the *information* that is deemed relevant to the intervention. CSH is a methodology that encourages systems thinkers and others to *reflect* critically on their boundary judgements.

For an account of the CSH the interested reader is invited to consult **Appendix F.**

2.7.3.1. The value of critical systems heuristics

The value of critical systems heuristics lies in its potential to reveal the unintended and sometimes concealed boundary judgements of our systems designs. In their work on developing housing services for older people, Midgley et al (1998) discovered that housing needs which could not be met by the current level of resources went unrecorded during the process to assess

housing need. The needs were ignored, or in the language of CSH, they were pushed beyond the boundary of concern. This meant that planners and policy makers interested in the aggregate level of housing need got a “false picture” of such needs. Any “improvements” would therefore be constrained by this understanding, and they would be unlikely to be seen as “improvements” in the eyes of other stakeholders, especially service users. Deceptions are inevitable in systems designs; the value of CSH is that it draws our attention to this inevitability and provides us with a means to systematically reflect on boundary judgements.

The value of CSH and boundary critique generally (see Midgley, below) can also be seen if we consider how it can be used in parallel with other methodologies. Freeman and Yearworth (2017) illustrate this with a reflective study of how five key stakeholders perceive the sources of influence affecting the Temple Quarter Enterprise Zone in Bristol. The authors find – perhaps predictably – considerable differences in the “reference systems” of individuals assumed to be representative of the key groups. Some stakeholders see the zone as a vehicle for achieving low carbon development to help address the climate change agenda; others see it as stimulating economic growth, and others still, as a political tool to win support and build reputation. Because the reference systems diverge so widely, the authors experience difficulties in applying PSM due to a “lack of *interessement* from stakeholders” making “problematisation” difficult. Interessement is defined as the “willingness / interest in a problem, which leads to the participation of an agency or person in seeking to understand or solve the problem” (Freeman & Yearworth, 2017). In the language of systems thinking, the authors suggest that one of the key stakeholders, Bristol City Council’s Future Cities Team, are the problem owners for the “sustainability vision”, but not the problem solvers. They are not in control and have little influence over other stakeholders – including partners in the council - who can take *decisions* that materially affect development in the TQEZ. The authors’ reflective application of CSH helps them to understand the missing sources of motivation and decision making in the plan to see the TQEZ as a vision for a low carbon, sustainable city.

However, the value of CSH and soft systems thinking more generally can be overstated. The theory of system differentiation (Luhmann, 2018) and Beer's VSM, for example, are built from very different philosophical assumptions and can explain some of the structural and behavioural complexity that Freeman and Yearworth (2017) experience in their ambitious study. Where CSH flounders, is that it has no real interest in accounting for how the high variety of reference systems is *reduced*, and why some reference systems assume a dominant role. For sure, human intentionality plays its part in generating perceived complexity, but this intentionality might be heavily circumscribed by larger system structures. The evidence is available from Freeman & Yearworth's (2017) study. Some stakeholders do not consider the low carbon vision for the TQEZ as a "problem for them" (Freeman & Yearworth, 2017, p. 26). This is not an indictment on their values - assuming low carbon to be a good thing - it is a more a recognition that these stakeholders are members of highly abstract functional systems, e.g., the economic system, the political system, the legal system etc. which have their own unique ways of processing information and directing action. If there are no legal, financial, or reputational "imperatives" to adopting a low carbon future in Bristol, and in the UK more widely, as the authors suggest, then it is hardly surprising to find a lack of "interessement". Freeman & Yearworth's (2017) research is extremely valuable in that it describes a case where the use of PSMs did not go to plan. As was commented earlier, such reports are few and far between (Connell, 2001 is an exception). Despite these difficulties, their faith in developing PSM and systems methodology to deal with these "new types of problems" is unshaken. They recommend new competencies for decision makers, managers and citizens, a form of widening the boundaries. A more guarded response might be more appropriate when Luhmann's ideas on functional differentiation are taken into account: "…the significance of the [Luhmann's] theory will always remain that a more controlled method of creating ideas can increase the probability of more serviceable results – above all, that *it can reduce the probability of creating useless excitement*" (Luhmann 1989 quoted in Borch, 2011, emphasis by Borch). CSH certainly has some value depending on the context, but there are limitations. I now turn to the issue of using CSH and the level of proficiency required.

2.7.3.2. The role of expertise in applying CSH

Being aware of boundaries is not an alien idea to most people, it makes intuitive sense. When we hear, see or read the news, many of us think about what is included in a news item, and what has been excluded. In Higher Education, we ask if the curriculum has been "colonised", does it have content that may marginalise certain groups or individuals? The process of thinking about boundaries is therefore not "unnatural" (Ulrich and Reynolds, 2010); CSH just formalises the thinking, making it more systematic. For these reasons, CSH does not place great demands on users. The availability of professional expertise is helpful, but not a necessity. In fact, a main feature of the methodology, as discussed in Appendix F, is to level up the expertise of those affected with the planners, or systems designers. CSH advocates would argue that users are not "setting" boundary judgements when they are "unfolding them", they are merely questioning them, and questioning does not need advanced skill. Several of the questions simply ask users to consider what aspects of the situation *ought* to be in the picture, and what has been left out.

Once users have an idea about this, attention can turn to the "*validity"* of the boundary judgements. There are "no objectively right or wrong" answers here (Ulrich & Reynolds, 2010, p.263), but the judgements can be defended when compared to *alternative* boundary judgements. This is a question of tracing the *consequences* of boundary judgements in the light of alternative judgements. Ulrich and Reynolds admit that clarifying consequences "require[s] careful scrutiny", and there is a hint that some professional expertise would be useful at this point. However, they claim general knowledge available to everyone makes it "perfectly reasonable to question boundary assumptions" (Ulrich & Reynolds, 2010, p. 263) Again Ulrich & Reynolds (2010) reiterate that "we practice boundary critique every day without being aware of it. The difference is we do not practice it consciously and systematically" (Ulrich & Reynolds, 2010, p.263). Such confidence in the descriptive power of CSH theory by its authors immediately provokes thinking that CSH, just like its PSM cousins, may be under-reported.

Against this, Klocker Larsen (2011) reports, in his application of CSH to Philippine coastal resource management, that participants found the questions too rigid and "felt constrained by [CSH's]…structure" (Klocker Larsen, 2011, p.69). In most studies, questions are "translated", adapted to the local context, as witnessed above with Midgley et al (2013). Ulrich's questions are "not all phrased in plain English" (Midgley, 2000, p. 298). Translation presupposes that the questions are fully understood in the first place and do not lose potency when translated. This appears to be undertaken by the intervener or consultant. Again, this potentially limits the uptake of CSH, if the consultant-cum-methodologist is a prerequisite. Klocker Larsen (2011) also finds that the heuristic questions come "logically prior to the context of application". Users prefer something more organic, something in which they can "analyse their own experiences… away from pre-determined formats and guidelines" (Klocker Larsen, 2011 p.73), which of course challenges the whole idea of structured methodology. In the difficult conditions of Philippine coastal resource 'management' where law breaking is commonplace, and where "strongmen" regularly control access to resources Larsen concludes, "dialogical boundary critique requires significant adaptation if it is to provide a liberating language for participants" (Klocker Larsen, 2011 p. 72).

2.7.3.3. The Identity and Distinctiveness of CSH

Outside of the systems thinking community critical systems heuristics gets little recognition. Within it the general idea of the critique of boundaries has been developed by Midgley (2000). This is a continuation of its general ideas and does not impair the identity and integrity of Ulrich's methodology. Midgley (2000) heightens our sensitivity to boundary judgements by introducing the distinction between primary and secondary boundaries. The former indicates a narrow boundary choice and the latter a wider boundary. Elements outside the primary boundary but within the secondary boundary become marginalised. Attribution of "profane" or "sacred" status to these marginal elements "stabilises the conflict" (Midgley, 2000, p. 144). Those who prefer the secondary boundary assign "sacred" status to the marginalised elements. By contrast the primary boundary makers confer "profane" status on the very same marginalised elements. This, to some extent, explains the dominance of certain boundary judgements. As I write this, American Democat voters are holding caucus

elections to elect a presidential candidate to run against the current incumbent (President Trump, a Republican). Voters, candidates and media will make implicit assumptions (boundary judgements) about the candidate qualities that are needed to hold the highest office. Certain qualities will be assigned “sacred” status and others “profane”. Socialist leanings, for example, will be assigned “profane” status by some voters and “sacred” by others. The dominant boundary will determine the prospects for each of the candidates. This of course is a great simplification of the complex processes involved, but Midgley’s model heightens the sensitivity of users of CSH, and boundary critique generally, to the ways in which information and people can be marginalised.

2.8. Multimethodologies (MM)

Jackson’s work on the SOSM and his meta-theoretical research of the social theories implied or made explicit by different management science methodologies led, inevitably, to an interest in developing what has become known as a multimethodology. Multimethodology involves “combining together more than one methodology (in whole or part) within a particular intervention” (Mingers, 1997, p. 2). The aim of multimethodology is to serve the interests of a pluralistic management science. A lively debate about how best to achieve this has existed since the mid-1990s, but the “argument for [some means of] methodological pluralism has basically been won” (Midgley et al 2017, p. 151).

There are numerous reasons why a multi-methodological approach is thought to be desirable. Most would concede with Mingers and Brocklesby (1997) that the world has become “multi-dimensional”. Making things more efficient, trying to get better understanding among groups, dealing with abuses of power, responding to human rights issues, exploring values, managing diversity, are all aspects of this “dimensionality”. It is assumed to be part and parcel of life, and some methodologies are decidedly better than others in addressing specific aspects of this dimensionality. Another reason for a multimethodological perspective is that “interventions” (usually) proceed in stages and therefore as more is learned about the situation, those responsible for directing effort can choose a new or adapt the existing methodology (Mingers and Brocklesby, 1997). Jackson (2019) suggests that multi-methodology is also in keeping with post-modernist critiques of “totalizing discourses”.

There are, however, different ways of realising a pluralist systems thinking approach which are explained below:

- Critical Systems Practice (Jackson, 2000; 2003; 2019)
- Systemic Intervention (Midgley, 2000)
- Multi-paradigm, multi-methodology (or Critical Pluralism) (Mingers, 1997a; 1997b; Mingers & Brocklesby, 1997)

2.8.1. Critical Systems Practice

Jackson's preferred vehicle for pluralism in 1991 was a meta-methodology called *Total Systems Integration (TSI)* (Flood & Jackson, 1991a). This was later revised and became Critical Systems Practice (Jackson, 2000; 2003; 2019). This multimethodology has three commitments – (1) "Critical awareness"; (2) "Pluralism"; and (3) "improvement" and four phases: (1) Creativity; (2) Choice; (3) Implementation; and (4) Reflection. In the creativity phase users of CSP "sweep in" (after Churchman, 1981) as many perspectives as possible using a range of techniques including "systems perspectives" (which act like metaphors, associated with functionalist, interpretive and radical change paradigms); rich pictures and general brainstorming. The outcome from this phase is to identify "primary and secondary issues that need to be addressed" (Jackson, 2019, p. 594). It is suggested that in practice, the primary and secondary issues come to the fore "relatively easily, usually without the need for facilitation" (Jackson, 2019, p. 598).

Stage 2 is about choice of methodologies; typically, one primary methodology, and a secondary one, if necessary. Users of CSP can refer to the SOSM to help with choice. For example, if the creativity stage resulted in the dominance of the cultural perspective in defining the primary issues, then attention would land on methodologies that are helpful in pluralist/simple contexts. Because of paradigm incommensurability, a reflective, conscious choice should be made of the dominant methodology. Methods and tools must be chosen at this stage too. Here, CSP is happy to appropriate "methods that originate from *outside* systems thinking, perhaps from Soft-OR…" (Jackson, 2019, p.599 emphasis added). CSP is flexible, especially with methods, "as the link between

methodologies and their embedded methods is… a relatively weak one" (Jackson, 2019, p. 535).

Stage 3 turns to implementation of the methods and tools guided by the "primary" (formerly in TSI "dominant" methodology) and accompanied by a "secondary" (formerly "dependent") methodology, if required by the situation. The concern here is for the users of CSP to be ever vigilant of the paradigms and methodology that are coordinating the efforts of the problem-solving endeavour. Through constantly re-iterating the allegiance that methodology has to its host paradigm, Jackson is reminding us to not denature methodology or method; doing so would lead to poor (pluralist) practice. In his earlier theoretical work (Jackson, 2003), he borrowed some labels used by Reed (1985) to describe possible futures for organisational analysis (OA) and, like Reed in respect of OA, charted the future of systems thinking/practice, declaring that a pluralist future was much preferred to "isolationism, imperialism or pragmatism". Even with the guidelines provided by TSI, and now CSP, Jackson is cautious of "back sliding" to imperialist or pragmatic positions, which are poor relations compared to what is possible in an ideal MM.

Stage 4 is the reflection stage; a stage added in CSP (not formerly present in TSI). Every use of CSP is considered to be a form of action research, as well as achieving practical results for those involved with the problem situation. As such, and following Checkland (1981), the intervention yields findings to hopefully improve the theory of multimethodology and the use of tools and techniques. CSP is also committed to "improvement" of the social systems it is used in, and so the reflective stage asks users to consider the improvements from the position of the different paradigms. Jackson sees this as "pluralism at all stages" (Jackson, 2019, p.600).

Jackson's earlier work on TSI was criticised by Tsoukas (1993), Mingers (1997b) and Midgley (2000) for claiming to hold a meta-paradigmatic position. He has overcome this criticism by insisting that CSP is able to view the philosophical assumptions and methodological principles of multiple paradigms as a result of second order critique. Midgley's (2000) solution to this dilemma is more explicit: critical systems thinking must, by definition, create its own paradigm. This is discussed in the next section.

2.8.2. Systemic Intervention

Jackson's strategy to produce a robust defence for the use and coordination of methodologies from rival paradigms with different views of reality was to look outside the systems discipline. He looked to social theory, including Habermas (1987) and to organisation theory (Reed, 1985). Only recently has he drawn explicitly on ideas of second order observation, to explain how critique of theoretical positions can take place. He has decisively come back to systems theory to try to resolve the dilemma. Midgley's (1996) response to the dilemma is to say that CST makes its own assumptions, just like any other paradigm, and therefore must itself constitute a new paradigm. He creates his own version of multi-methodology – Systemic Intervention (Midgley, 2000) – and creates a process philosophy, and remains within the systems tradition to mount its defence.

To understand Midgley's theory something must be known about his concept of a "knowledge generating system" (Midgley, 2000, p.76). This is an abstract idea which points to a general unspecified class of "systems" which produce knowledge. Midgley discusses various authors, all of whom employ the concept of system to specify what the "knowledge generating system must be like" (p.78). In doing so, these authors – Maturana (1988), von Bertalanffy (1968) and Bateson (1970) – are talking about *content*, and Midgley would prefer to give "analytical primacy" to the *process "*of bringing knowledge into being" (Midgley, 2000, p.78), through the *process of making boundary judgments*. Each time we make a distinction, we say something about what is included within the boundary and what is excluded. Midgley's point is that when making boundary judgements (or in the language of Spencer-Brown (1969), Cabrera (2006) and others "making distinctions") we are saying something about *subjects* and *objects*. We look "outwards" toward the boundary and look "inwards" towards the "knowledge generating system" that produced the distinction. The original systems pioneers bequeathed numerous concepts to us – system, boundary, sub-system, environment etc. - and it is Midgley's return to the idea of boundary, drawing on the work of Churchman (1981) and Ulrich (1983) that makes boundary judgements so critical.

The logical consequence of this theory for intervention practice is that boundary critique “must precede” methodology choice (Ulrich, 2003). The “solution” seems to be less messy than Jackson’s CSP, where pluralism is present at “all stages”. A practitioner must decide what information and which people will be involved at the early stages of intervention. They then ask who might be affected by the intervention, making conscious choices about appropriate methodology and methods, after the thorough deliberation about system boundaries. Of course, Jackson (2019) sees Midgley’s position as a form of theoretical and methodological “imperialism”, and this can inhibit the multi-methodological and multi-paradigm vision that critical systems thinking aspires to be.

2.8.3. Multi-paradigm, multi-methodology (critical pluralism).

A third way to justify a multi-methodological and multi-paradigmatic, critical systems approach has been developed by Mingers (1997a, 1997b), Mingers & Brocklesby (1997), and later modified by Castellini & Paucar-Caceres (2019). Like Midgley (2000), Mingers (1997b) makes reference to Habermas' three worlds - the material, social and personal - to characterise the range of complexity and dimensionality, that might be found in what Mingers (following Checkland, 1981) calls the "problem content system" (Mingers, 1997b, p.420). A problem content system is dynamic and historically "pre-formed". Any relation to it will see different material, social and personal elements appear and disappear, depending on the "intervention system" (the agents undertaking the intervention), and the intellectual resources available, otherwise known as the "intellectual resources system". These three notional systems are dynamically related and are unique in any situation, given that there will be different agents involved, with different levels of skill and ability, with different levels of competence in, and experience of, the available intellectual resources, which themselves change over time as more is learned from practice and reflection. Together, these three systems are the context for multimethodology (Mingers, 1997a).

Because of the dynamic interactions of the material, social and personal worlds, and because of the relationships that exist between the three notional systems, Mingers (1997a) argues that interventions are a *process* rather than a discrete

event, and, as such, one might reasonably expect different "phases", or different types of activities to be prevalent at different stages of the intervention. Mingers (1997a) suggests four categories of generic activities in: appreciation, analysis, assessment, and action (the four A's). This allows Mingers to create a matrix table which places the three worlds on the vertical dimension (the dimensionality of the problem situation), and the four A's across the horizontal (the phases of a multi-methodological intervention). Conveniently, some of the methodologies and their methods are better suited to these activities than are others. The resulting matrix permits a multi-methodologist to decompose single methodologies, so that specific methods or techniques can be aligned with specific dimensions of the problem situation. For example, SCA (see section 2.5) is particularly strong at getting people to agree and to decide a course of action, by creating something called a "commitment package". If a practitioner(s) perceives a situation as requiring an episode which urges people to decide an action through a commitment package, then the practitioner may "call upon" this method. Arranged alongside other methods, perhaps extracted from other methodologies, the practitioner will creatively design a bespoke or *ad hoc* methodology to address the situation of concern. A good example of this is Castellini & Paucar-Caceres (2019) study of integrating methodologies from soft-OR with quality management tools and ideas in the textile sector.

One advantage of Mingers' framework is the emphasis he places on the agent(s) directing the intervention. Detailed awareness and understanding of single methodologies and their methods are seen as vitally important for those who want to link parts of methodologies together. Poor awareness, insufficient competence, preferences for particular methodologies over others, where this is not justified, can all lead to an impoverished intervention, or, in particularly egregious cases, can risk doing more harm than good. This too is important for the research methodology employed in this thesis, and I will have more to say about this in chapter 3.

Mingers' version of MM appears to provide more liberty and freedom to would-be practitioners than Jackson's (2019) "ideal type" MM. However, for some, this can be deceptive. Mingers' later work uses Critical Realism (CR) to underpin the coordination of methodology and methods in intervention practice (Mingers, 2016). But for Jackson (2019) this, like Midgley's SI, is a form of "imperialism",

and as a consequence, other paradigms of social thought are "denatured", because they are coordinated from a critical realist perspective. There is insufficient space to cover the debate about MM in any more detail here. It should come as no surprise that critical systems thinking puts a great burden on newcomers to systemic PSM to be multi-methodology literate. Advocates of CST and MM will say this is a necessity given the multi-dimensionality of the world. The consequences of this in respect of the three themes is taken up in the next sub-sections.

2.8.3.1. The value of critical systems thinking and practice

CSP might be perceived as an elegant act of assembly, a putting together – much in the way a systems thinker would be expected to – of the most worked through ideas in systems thinking, which when applied have obtained results and have brought about “improvement”. There is general agreement among systems thinkers that the ideas have value and are “powerful”. There are numerous accounts by researchers who personally vouch for the success of an intervention using single case studies (see Midgley et al, 2013).

However, there are lingering doubts that the ideas have not achieved greater penetration. Systems methodologies and tools are not first choice approaches in the same way that way that total quality management (TQM), balanced scorecards or project management methodologies are. Jackson (1999, 2003) describes these as “fads”. There is a sense that the systems community has produced numerous powerful ideas, but the world won’t listen. Practising managers are inundated with “quick fix” tools that fail because they are not holistic; they do not address the richly interconnected problem situations that managers increasingly face. Ison too (2010), sees the pervasive influence of such tools and ideas as forces which work against a genuine systemic practice. He singles out the target driven culture and what he calls the “projectified world” (the dominant view of how work is organised) for criticism (Ison, 2010). These have become institutionalised; they reinforce the idea that problem management is largely a technical matter, where the desire for certainty is essential. As a result, systems thinkers have less opportunity to have the impact they desire to create thriving “systemic practice”. So, systems people face two challenges: (1) designing effective methods and (2) finding contexts conducive

to “enacting systems practice” (Ison, 2010; Ison & Straw, 2020). Ison may well be right, but as will become apparent below, there are legitimate questions to be answered about whether critical systems thinking has made enough effort to develop new practical methodologies and methods, or whether it has been overly pre-occupied within defining legitimate standards and guidelines for employing methodologies.

2.8.3.2. The Role of Expertise in Critical Systems Thinking/Practice

The most obvious consequence of multimethodology (and the wider project of CST) is the demand it puts on users for the “wide range of knowledge, skills and flexibility required of practitioners” (Mingers & Brocklesby, 1996, p. 420). If the literature reports misgivings, about SSM’s methods and techniques, which is commonly regarded as the most developed single methodology, and one that is supposedly a “take away”, then what kind of reaction can we expect at the prospect of practising multimethodology? The demands placed on practitioners to understand multiple methodologies, underpinned by different social theories, are excessive (Eden et al., 2009). Advocates of MM recognise these cognitive limits and know that they could undermine the “potency” of a pluralist enterprise. But some of the response is somewhat paltry: “start with just a couple of methods and proceed from there” (Midgley et al, 2017, p.156).

Critical systems thinking’s view of the manager/ consultant/ analyst/ intervener/ agent (the variations in this role are never entirely made clear and are open to further theoretical development) seems all-knowing, a kind of renaissance figure, who can easily shift – like some of academia’s best researchers – between paradigms, creating sophisticated methodology for each problem that is faced. But one may question how realistic this is. The evidence is mixed, depending on where you look. Brocklesby (1997) thinks multi-methodology literacy is “unlikely” but “not impossible”. Pollack (2009) (quoted in Jackson, 2019) on the other hand, in an application of MM to information systems, witnesses “frequent swaps… between hard and soft paradigms” (Pollack, 2009, p. 163). Here we go back to the persistent practice-theory gap which in this context is made most forcibly by Zhu (2011) who states: “combining multiple methodologies works in practice, but not yet in theory” (Zhu, 2011, p. 784).

2.8.3.3. Identity and Distinctiveness of Critical Systems Thinking & Practice

In some ways the identity of CST/CSP is difficult to pin down because it is an evolving debate and not a "statement of final position" (Midgley, 1996). This is understandable at the level of theory. As was mentioned earlier, multimethodology has won the argument (Midgley et al, 2017). It is "desirable" and meets the perceived need of users (demand for method that helps manage complexity) but debates about how best to implement it are ongoing.

It seems apposite here to make a distinction between theoretical and practical coherence, acknowledging of course Lewin's (1945) adage that "nothing is more practical than a good theory"(quoted in van der Ven, 1989). The charge is that CST has been overly pre-occupied with searching for theoretical 'coherence'. For Zhu (2011), practitioners are not that interested, because they must cope with ever changing situations and adapt their practice as they go along, storing any theoretical insights for themselves. Theoretical coherence does not serve wider adoption of systems thinking then; it is an academic pursuit. The diversity of approaches may indeed be welcomed, but rules on how and when to use different approaches are less welcome. The pragmatists – which includes critics like Ormerod (2008) and Zhu (2011) - want to start from the "situated experiences of OR professionals" (Zhu, 2011, p793.)

> Current theorising is focusing on finding the globally right 'grids', 'typologies' and 'underpinnings' as general theoretical solutions, from existing socio-philosophical 'paradigms', from an observer's perspective, and then 'translating' these theoretical solutions into 'a form that managers can use', instead of the other way around—tracing and accounting for OR workers' situated experiences, from the participants' perspectives, and then sharing these experiences with the wider public via refined education programmes so as to enhance competence and improve performance; that is: begins with and ends in *practices* (2011, p793, emphasis added).

For those in the pragmatist camp then, the focus of research should be situated experiences, helping managers to reflect on their assumptions and competence. Zhu (2011) presents a future which abandons “paradigm”. There is some merit in this practice-leads-theory argument and even Jackson (2019) has some “sympathy with those who find CST’s interminable theoretical arguments irritating” (Jackson, 2019, p. 21). Perhaps there is some middle ground, where adequate concern for methodology choice is not side-lined because of the pressure of the situation. One possibility is to create some accessible accounts of “failure stories” which serve the “practitioner’s resource pool”, something which Zhu (2011) advocates, but also reminds us of the perils of (the wrong) methodology choice. An example from my own practice is provided below.

In an earlier part of my career, I was an interim project management consultant working for a local authority. After winning the trust of my client on some smaller projects I was quickly appointed as project manager for my client’s largest project, a £50 million housing-led regeneration scheme. I inherited the project, which at the time was classed as “failing”, and I got to work on trying to get the project back on track. There was insufficient funding (subsidy) for the scheme, so my priority was to secure the funding, build credibility and manage all relevant stakeholders. The masterplan for the development had already been endorsed by the community, or more accurately, by most of the community. The scheme included the usual things you would expect to see in a regeneration scheme: new houses, refurbished homes, improved amenity space, roads and infrastructure. But all projects have their idiosyncrasies, and this regeneration scheme occupied land that was bound on one side by a city farm, which tended animals and grew vegetables. A dedicated farm manager supervised both permanent and volunteer staff and the farm was open to the community, providing a lot of informal work and visiting opportunities for those with learning difficulties. The farm was really a place of education. When I asked more obvious stakeholders about the farm in some of my earliest meetings, people tended to raise their eyebrows, made quips, or generally digressed. I had the feeling that something was amiss but did not pursue it; there seemed to be more pressing priorities. One feature of the masterplan pointed to acquiring about 6 metres of land around the edge of the farm

boundary. I knew the land was owned by the local authority, my client, and leased to the farm. The lease had only 6 months to run.

At this stage of my career, I was fresh out of an MBA. My head was full of game theory, having been inspired by a Professor of Economics. I was over-confident that I could negotiate an agreement with the farm. The Leader of the Council and its Chief Executive had both encouraged me to do some finding out and to agree something in recompense for the farm's loss of land. At first, the farm was amicable, and they let me join one of their board meetings as a guest. The Chair was very accommodating. I explained the aims of the regeneration scheme and there was some debate. At a subsequent meeting I met different board members who were vehemently opposed to the loss of land for the purpose of building a road. I asked what the local authority could do to compensate for this loss of land, discussing the prospect of new buildings and/or a new site. The people I met had no interest or intention in striking a bargain. Later, after the meeting, the local newspaper carried stories of how the farm was being manipulated by the local authority and I was in the firing line. Social media was awash with critical comments about consultants employed by the Local Authority!

The point of this story is to emphasise the importance of methodology choice. I wasn't consciously using a *systems approach or a PSM*, though aspects of game theory have found their way into some lesser-known PSMs (see Bennett, Bryant and Howard Drama Theory (2001)). But I was employing (unreflectively) a methodology. The point I make is that reflecting on methodology choice and grounding one's choice is essential. Done badly it can make management of the ongoing situation much harder. It can create new obstacles that slow projects down or, even worse, cause ripple effects which create problems elsewhere (e.g., reputational problems for the Leader of the Council). The choice of relevant methodology and methods is a perennial issue and I cannot see how we can avoid this in actual practice. Luckily for me, the above project ended well. We were successful in securing £16m for the project from the Government, which allowed us to build out some early phases. This inspired confidence and attracted further investment.

Nonaka & Zhu (2012) argue that we need to talk about successful and unsuccessful interventions if we are to make theory and practice relevant. There are too few examples of where things go wrong (Connell, 2001; Freeman & Yearworth, 2016 are exceptions). The MM debate has gone on too long, is tortuous, and ends in theoretical cul-de-sacs (Zhu, 2011), but the idea of “abandoning paradigm” seems unlikely and arguably works against the importance of choosing the right approach.

Another characteristic of CST referred to above is the question of how it relates to other mainstream management ideas. CST now makes some bold claims in that it can see no reason why it cannot improve the “theory and practice of enterprise architecture, business process reengineering, organisational learning, change management, service systems science, and epidemiology” (Jackson, 2019, p.525). To do so, CST would first have to account for why its application record is at best “patchy”.

2.9. Discussion and conclusions

This chapter has summarised some of the most influential systems methodologies and PSMs to emerge in the literature and which continue to be the subject of much academic debate. The focus has been on systems approaches that are within the grasp of practising managers. The methodologies provide a range of processes and tools to help managers see situations as *wholes*, something which is assumed to be increasingly useful in managing complexity. A newcomer to systems ideas can seek guidance from two well established communities - Soft OR and Critical Systems Thinking. Unsurprisingly, proponents of systems thinking see great potential in their ideas. The ideas encourage managers to think seriously about *purpose;* in SSM, they shift “systemicity” from the real world to the process of inquiring about the real world. This is a direct route to creativity and to thinking differently. The VSM offers a credible account of complexity absorption and variety engineering, helping managers to better understand questions about structure, autonomy, and control. CSH imagines the “citizen planner”, pointing to where improvement can occur in complex social systems. Systemic Intervention encourages agents to be conscious of boundary choices leading to a better appreciation of what “improvement” can mean and for whom. CSP helps managers to make

informed choices about methodology and methods. There is no shortage of confidence in the potency of the ideas. Proponents of Soft OR see great virtue in using qualitative models as “transitional objects” on the way to learning holistically about a problem situation before negotiating and deciding actions. Their methods encourage widescale participation, providing procedural justice and transparency. The design of methods enhances the potential for creativity and increases the number of potential options for action. The methods are productive and observe managers’ needs to continually plan and take action.

However, despite the claims made about the approaches and their ready availability for adoption, questions remain about their take-up (Harwood, 2019). There is under-representation in the leading O.R. journals (Harwood, 2019; Lowe & Yearworth, 2019). There is mistrust about the lack of rigour associated with the methods (Ackermann et al, 2020); concerns about users’ ability to employ the methods effectively (Checkland & Scholes, 1990; Ackermann et al 2020); and the potential opportunities for PSM and systems thinking are said to far outstrip their actual application (Rosenhead, 2006). There is no real sense of the ideas becoming domesticated.

The current research agenda – reflected in the “three themes” used to organise the chapter - mirrors these concerns about the perceived lack of penetration, the perception that more needs to be done. There are concerns about establishing better evaluations of interventions so that would-be users have greater confidence before implementing the ideas (Midgley et al, 2013; Tully et al 2019; White, 2006); there are concerns about providing the necessary expertise and opportunities for apprenticeship so that systems thinking and PSM can flourish (Keys, 2006; Rosenhead, 2006; Ormerod, 2014, Ison, 2014); there are concerns about the name or label of “PSM” which leads to poor recognition, confusion among users, and does not adequately define the technology (Ackermann, 2012; 2019). Similar arguments have been made about the confused field of systems thinking (Cabrera, 2006). If we add to this Ackoff’s (2006) comments, that systems thinking is too radical for practising managers to commission, then we get some idea of the current resistance to systemic PSM, which helps to explain its lack of penetration.

However, there may be different lines of inquiry to help illuminate this topic further. There are three ways in which some of the current assumptions can be examined more closely. The first concerns assumptions that are made in the literature about practising managers. The second examines the claim that the thinking embodied in systems approaches is seemingly “natural” and “everyday”. The third and final assumption refers to the importance of constitutive rules (CR).

In his review of British Cyberneticians, Pickering (2011) emphasises the “hobbyist”, “amateurish” and “experimental” nature of much of their work. This is not a criticism. Pickering is clearly in awe of the creativity and radical thinking that flourished during the period when British cybernetics was at its peak. He is excited about how the discipline provided “sketches of another future”, the subtitle of his book, and fascinated by its “performative ontology”. Biographical details – certainly those of Beer – do confirm this “hobbyist” interpretation, Beer’s work was never really part of a formal institute, conducting experiments and trying out ideas in his spare time. This is resonant, to some degree, with Checkland’s remarks about doing action research with, and writing for, managers with a “busy curiosity”, and a shared concern to produce mode 2 knowledge (Tranfield and Starkey, 1998). The originators of the methodologies outlined above make countless assumptions about managers and management. Looking outwards at managers, they are at the “mercy of fads, fashions and quick fixes”; they are “ill-served by management theory” (see Jackson, 2003); their thinking “lacks clarity”, is “unstructured” and they “thrash around” (see Checkland & Poulter, 2006); they are tethered to hopeless, redundant ideas like the organisation chart (Beer, 1979). Looking normatively, and drawing inferences from theory and methodological principles covered earlier, the “ideal type” manager is a consummate methodologist; concerned about the wider picture; is agile, busy and able to move between different levels and perspectives; is curious; and is capable of internalising complex methodology and method. These are caricatures to some extent, but at the moment proponents of PSM and Systems Thinking are putting a lot of faith in training courses as a means to improve rigour and greater acceptance (Ackermann et al, 2020). A complementary approach might be to seek out the

busily curious again and examine how they accommodate or resist systemic PSM.

A second assumption worthy of closer examination is the tendency to assert that many of the approaches and ideas are almost “second nature”, general enough to have wide applicability and to be part of the “everyday”. Both Checkland & Scholes (1990) and Ulrich (2003) suggest that the ideas are just organised ways of thinking. If this is the case, then the reliance on tools and methods is questionable. Cabrera (2006) makes this challenge to systems thinking. His view is that systems work is about cognition and meta-cognition. “Thinking” is portrayed as a complex adaptive system based on four “fundamental and universal structures”. Cabrera & Colosi (2012) argue that when we think and create knowledge, we:

- make *distinctions* between things;
- organise thinking into *systems* of parts and wholes
- *relate* things to each other
- act from various *perspectives*

(Cabrera & Colosi, 2012).

These “universal structures” are conveniently represented by the characters ‘DSRP’. It is worth emphasising, that because the structures are claimed to be universal, they do not just pertain to systems thinking but to *all* thinking. This makes for a very bold claim. The theory has profound implications for systems practice, because it suggests that managers (or people generally) only need to use DSRP concepts more consciously in order to make their thinking more systemic (Midgley, 2008). It suggests that if we wish to see a greater uptake of systems thinking ideas we should concentrate on DSRP thinking rather than learning systems tools and methods. The importance of Cabrera et al’s work should not be underestimated because it opens up the possibility for building on existing capacity and potentiality.

The final assumption worthy of closer inspection relates to constitutive rules (CR). In much of the literature CR is used inwardly to protect the purity and integrity of systems ideas. A more productive use of CR is to look outwards and compare what managers do with what the constitutive rules say. This is

achieved by Yearworth & White (2014). They suggest that problem solving activity observed in fields as diverse as engineering and technology is, to all intents and purposes, the application of PSM in another guise. In other words, they detect the “non-codified” use of PSMs. They do so by creating a set of testable propositions which can be applied to a variety of case studies and demonstrate cases where non codified use of PSM occurs. Without explicitly questioning how this happens among engineers who have not been trained in PSMs, the authors speculate that problem structuring skills may be particular to individuals, or there is something about the availability of tools, or something particular to an organisation’s culture which cultivates the use of PSMs. These questions are left open. What is important is that their work recognises that non-codified PSM use might be prevalent in organisations, contrary to assumptions made about the lack of penetration.

The inevitable consequence of “mode 2 use” and internalised methodology is that it is impossible to detect without resort to constitutive rules. This makes empirical work all the more difficult. But, a *practical* “turn” in systems thinking points towards working with managers to capture their perspectives on how they manage complexity. How do practising managers, if at all, make use of systems ideas and concepts? Only by engaging with practising managers can we hope to understand why systems thinking has not yet received the recognition it perhaps deserves. In the next chapter I discuss how this can be done methodologically.

Chapter 3 Methodology

3.1. Introduction

Chapter 1 argued that more systems thinking and more application of systemic PSMs is looked upon as a good thing and I referred to the OECD's and the UN's respective announcements in this regard. But there is no guarantee that ideas that have been in development over the past 50 years will finally get the recognition they may deserve and will be implemented on a large scale, just because of the endorsement of world bodies. Chapters one and two described some of the obstacles to adoption, but the current literature falls short in explaining how practising managers can accommodate systems approaches alongside their current practice. The aim of this chapter is to formulate a research design which will help to explore this issue further and address the research questions which were outlined in the introduction and are repeated here for convenience:

- How do practising managers, who are new to systemic PSM, *accommodate* systems ideas? Under what circumstances, if at all, do they resist systemic PSMs? How do they combine these ideas, if at all, with their existing and preferred ways of managing complex problems? How, if at all, does the organization(s) - which is the main context for systemic PSM application – facilitate or constrain the deployment of systemic PSMs?
- What evidence is there that practising managers employ, or want to employ, systems concepts (e.g., emergent properties of the whole, hierarchy, communication and control, relationships between elements etc.) and systemic PSMs to explore and learn about their problem situations, and to take action?

This chapter is structured as follows. Section 3.2 makes some obligatory remarks about the philosophical assumptions made in this research. Some arguments are set out about the choice of an interpretive approach to the methodology which signals the interpretive and constructivist assumptions of the study. But these are *choices* for this study, and, in general, I would defend a broadly pluralist approach to social science. Section 3.3 reiterates the general

aims of the research followed, in section 3.4, by an outline of the research design. I put forward an argument for a multiple-case research design, and contrast this with aspects of action research which have been the dominant form of research method for major studies investigating the efficacy of systemic PSM. Section 3.5 describes the components of the research design and includes detail on how data have been collected, the different types of data, and how this has been synthesised and analysed. Research ethics and quality criteria are also discussed in this sub-section.

3.2. Philosophical orientation and assumptions

The approach to accessing, investigating, and presenting knowledge in this thesis makes interpretive and constructivist assumptions. This becomes self-evident as I describe the research design below, describing some of the choices that were made and the contingencies. But overall, and in the wider context of social science, I would argue with others (e.g., Cabrera, 2006; Gregory, 1996; Jackson, 1997; 1999; 2019; Midgley, 1996; 2000; 2003) that if we are to understand, explain and interpret social phenomena – including how we make sense of management and organization – our best chances of doing so will be to have at our disposal multiple paradigms, theories, methods, frameworks, and lenses. The difficulties arise when one has to make a choice from the vast range of paradigms, theories, and methodologies, and, even prior to this, one has to justify that one indeed does have a choice given the arguments that are made about paradigm incommensurability (Jackson & Carter, 1993). There is insufficient space to defend how this choice is possible and to prove one's multi-paradigm literacy and understanding. But I refer to credible accounts in the literature (e.g., Jackson's (2019) appropriation of Luhmann (1995) to create a form of "second order critique"; and Midgley's (2000) "knowledge generating systems" and process philosophy). Both of these accounts have influenced my thinking on the matter of philosophical and methodological orientation.

Critics may argue that this sounds like "egalitarian ambivalence" (Johnson and Duberley, 2000), but research in management and organisation is full of competing perspectives. Macintyre (1985) argues that social scientists have a tolerant attitude to the co-existence of different theories and explanations because human life is so messy and unpredictable. For this reason, different

explanations and understandings can co-exist and, more importantly, multiple theories can be used as lenses to examine empirical findings. Tolerance, and the efforts that researchers go to be reflective, should not be confused with ambivalence. I am open to different interpretations and challenges about the assumptions underlying this research.

So, pluralism is eclectic, and in principle researchers can be selective, designing a methodology to suit the situation at hand. Once the methodology is revealed the philosophical assumptions are exposed; and the critics can get to work. The *situation* drives this selection. The question then becomes how the situation is seen and framed by those who observe it. Situations can be described in various ways. The pluralist believes that one can jump around, so to speak, to see the situation from different positions and can then reflect on those positions, subject them to critique and eventually make a choice. Some researchers for example, have been socialised into thinking that every doctoral thesis must have a philosophy section and must start with what is assumed to be the highest and most general level categories – e.g., meta-theories, ontology, epistemology etc. Once those pieces of the jigsaw are in place, one can then think about the methodology that fits with the higher-level categories. But why not do this in reverse? Why not begin with methodology and see what this reveals about one's ontological and epistemological assumptions? And why ontology, epistemology, human nature and methodology, the original dimensions of Burrell and Morgan's (1979) framework? Why not start with complexity for example? Notwithstanding the reasonable objection to this – that complexity presupposes some ontological commitment - I will have more to say about complexity below and in the decisive choice of using Luhmann's (2018; 1995) complex social systems theory as a lens to reinterpret the case studies.

As for meeting the orthodox requirement to set out the philosophical orientation early on, I declare that the approach in this thesis is nominalist and interpretivist/constructionist. Many systemic PSMs are built on these assumptions and there seems to be no reason to think that the same assumptions cannot be used to attempt to understand the viewpoints of managers and others in how they relate to, accept, or reject systemic PSMs.

Finally, in this section I will make some remarks about *complexity*. The concept of complexity is not normally a talking point in philosophical sections. But perhaps the concept will get more attention as complexity theory grows (Byrne & Callaghan, 2014). Systemic-PSMs are designed with social complexity in mind. They arguably increase the complexity of the situation by inviting more stakeholder views in the early stages of intervention, and perhaps complexity contracts again as stakeholders seek accommodation between different viewpoints. But there are many other ways of reducing and creating complexity in what Luhmann (2018) calls "secondary complexity". *Organizations* perform this function and are a means of vastly reducing complexity. They have greater durability than so called "*interaction systems*" which just require the co-presence of individuals and are in effect ephemeral phenomena (Borch, 2011). Interventions that use systemic PSMs are typically temporary, one-off affairs (as mentioned in chapter 2). But the *context* of intervention using systemic PSM is almost always that it takes place in some form of identifiable organisation(s). How these organisations are constituted - and more will be said about this in chapters five and six - they play their part in reducing complexity and creating "secondary complexity". This may mean that advocates of systemic PSMs underestimate the need of practising managers and their teams to reduce complexity or undervalue managers' complicit acceptance of this in everyday practice. This of course is just a hunch at this stage of the inquiry, but as Siggelkow (2007, p21) (citing Suddaby, 2006) notes, hunches are "useful" and "inevitable" in guiding observations of case studies. It is as well to articulate and declare these potentially useful theoretical lenses before commencing a full analysis of the cases. For this reason, a "Luhmannian" lens is also added to the theoretical lenses that can be used to analyse the cases (see section 5.3).

3.3. Aims of the research

This research has three broad aims:

- To examine the practical relevance of systemic PSM interventions in addressing complex problem situations with managers in four case study organisations.
- To examine how these interventions compare to existing problem-solving practices in each of the case study organisations.

- To build an inductive theory of how and why practising managers accommodate and/or resist systemic PSM.

These aims serve the wider purpose of enhancing our knowledge about the adoption and application of systemic PSM, making the contributions outlined in section 6.2.

3.4. Overview of the research design

An overview of the research design is provided in Figure 3-1 below. A multiple case study design was adopted using theoretical sampling. More details on sampling are provided below. Each case was examined for its own particularities and understood on its own terms as a “distinct experiment” (Eisenhardt, 1989) before using the cases “instrumentally” (Stake, 1995) as a means of better understanding the related phenomena of adoption, application, accommodation and resistance. Each case is first examined as an analytical unit. Later, after exhausting the within-case analysis, patterns of relationships among constructs across cases are identified and compared to existing literature leading to a theory of how practising managers accommodate and resist systemic PSM.

Following Eisenhardt (1989) the case histories are used to generate emergent theory. Currently within Soft OR and Critical Systems Thinking (CST) there is a lack of overarching theory which explains why managers fail to adopt systemic PSM. There are some explanations as identified in chapter 2 but there is no single theory that explains the phenomenon adequately. For this reason, the research questions identified at the outset (see section 3.1) are broadly scoped. This creates more flexibility for the research design increasing the opportunity for interesting findings.

Figure 3.1 is inspired by Checkland & Poulter’s (2006) LUMAS model (“Learning for a user by a methodology-informed approach to a situation”). LUMAS is a generic model and can be applied to *any* methodology which tries to makes sense of social phenomena. The model in Figure 3-1 points out some key features of the research design. Several of these are markedly different from the action research which typically underpins most systemic PSMs research. Some of these differences and key objectives are:

- To investigate a systemic PSM intervention *in the context of* other extant problem-solving approaches, emphasising the *context of organization*.
- To encourage comparisons of problem-solving approaches.
- To encourage discourses about problem-solving practices and discourses about *choices* of problem-solving approach within the organizational context.

Finally, one additional feature of Figure 3-1 is highlighted. The research design takes into account the possibility of underreported systemic PSM which was identified by Yearworth & White (2014). The model below includes links to “constitutive rules” (in the bottom left-hand corner) so that the research is alert to the possibilities that managers in the case studies are using approaches that share some similarity with systemic PSM ideas.

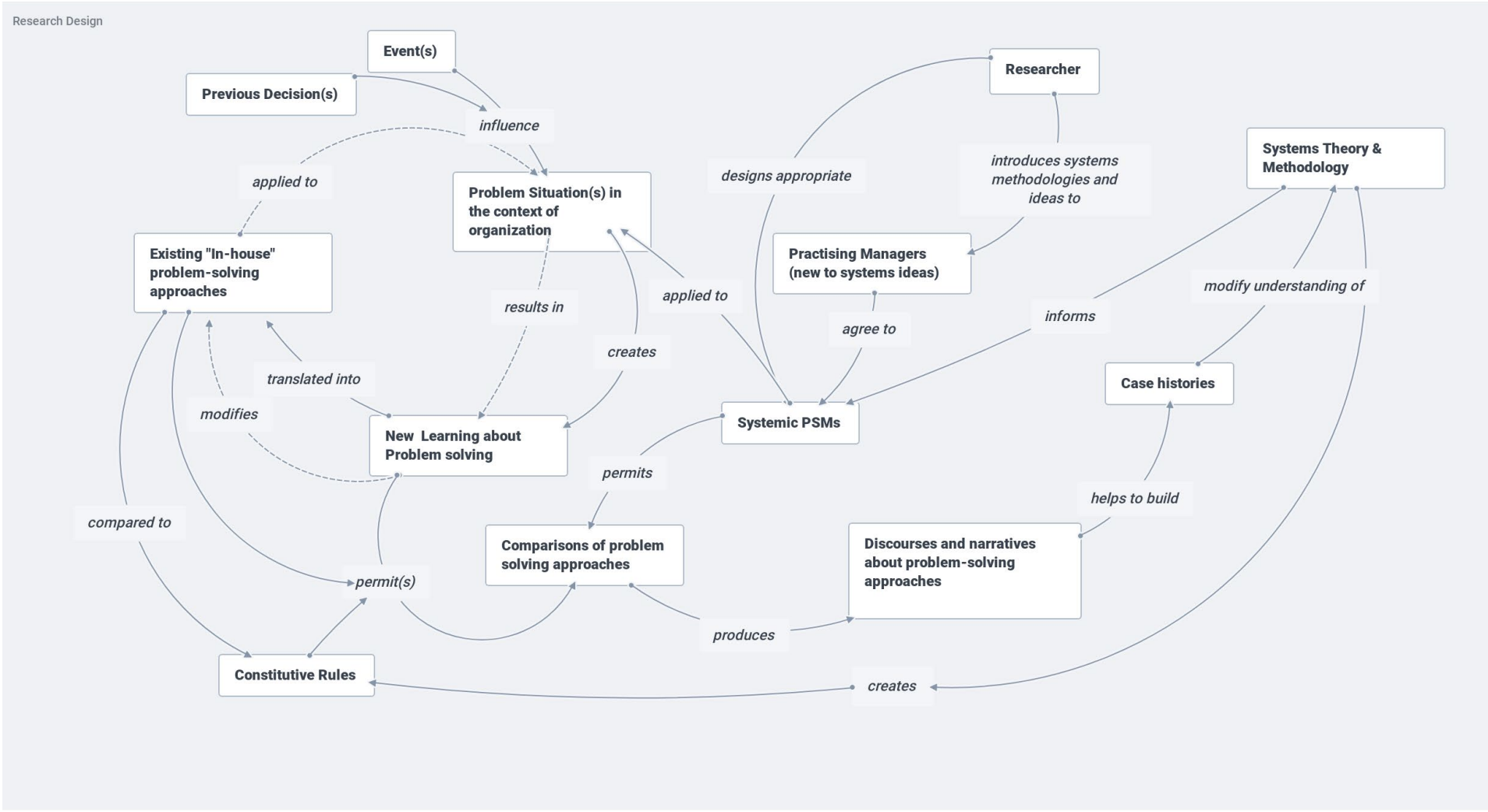


Figure 3-1 Schema of Research Design

3.4.1. A multiple case studies approach

The aim of this section is to make clear my use of the case study method and to defend its choice. Individual case study experiences are widely reported in systems thinking and OR literatures. Appreciation of how the phrase is used and what is meant requires some closer inspection, however. I begin with some discussion of the case study method as understood in a *research* context (rather than *systems practice*) and as a means of grounding theory about the application, adoption and resistance to systemic PSM. I then turn to how cases are currently used in the systems thinking and OR literature more generally, identifying this with action research which has been highly productive in establishing credible knowledge about the efficacy of systemic PSM, but has been somewhat muted on questions about the large-scale adoption of methods. Some of the lessons from action research, however, are an important source for providing valuable quality criteria for case study research of the type followed here.

3.4.1.1. Setting out some variants of case study method and defending the multi-case approach

Easterby-Smith et al (2018, p.119) provide a useful (and simplified) summary of case method variants based on positivist and constructionist epistemologies. Their table is adapted below as Table 3-1.

	Postivist (Yin)	**Positivist and constructionist (Eisenhardt)**	**The present study**	**Constructionist (Stake)**
Design	Prior	Flexible	Flexible	Emergent
Sample	Up to 30	4-10	4[1]	1 or more
Analysis	Cross-case	Cross-case and within-case	Cross-case and within-case	Within-case
Theory	Testing	Generation	Generation and Action	Action

Table 3-1 The present study in relation to Easterby-Smith et al's (2018) Case Summary

[1] Five cases were originally planned, the fifth was aborted in March 2020, because of the Covid 19 pandemic.

My research design sits somewhere between Eisenhardt's intermediate position (on Easterby-Smith et-al's (2018) 3 column table) and Stake's constructionist position, indicated in grey in Table 3-1. The design is flexible, allowing for "surprise" findings from individual cases. Within-case and cross-case analyses are performed in line with (1) an "intrinsic"/"expressive" orientation (Stake, 1995; 2006) and (2) an "instrumental" orientation (Stake, 1995). The intrinsic orientation helps to reveal why a case occurs as it did, developing a rich and ideographic understanding of each individual case. The instrumental orientation applies replication logic across cases, finding out whether each case confirms or disconfirms inferences made from the other cases (Graebner, 2004). Multiple cases are used to develop a deeper underpinning of the theory, making it more credible, "generalisable" and testable, though there are limitations of course (see section 3.5.7).

In order to make sense of problem-solving activities in each case organisation, and in agreement with a manager who gave consent to the research, a systems intervention was designed to address a problem of concern. This aspect is a departure from most orthodox case study method. Stake (1995, p. 44) suggests that "qualitative researchers are noninterventionists… trying to see what would have happened if they were not there". But this is an unattainable standard and he recognises that qualitative researchers:

> "favour a personal capture of the experience so, from their own involvement, they can interpret it, recognise its contexts, puzzle the many meanings while still there, and pass along an experiential, naturalistic account for readers to participate themselves in some similar reflection." Stake (1995, p. 44)

A main aim of the design is to acquaint practising managers (the uninitiated) with systemic PSM. In this way the systems intervention is designed as much as possible to make participants feel at ease and to earn their trust. It mirrors some of the benefits obtainable through action research and cooperative inquiry because both researcher and researched are interested in the problem of concern and how the problem situation might be improved (McClintock, Ison & Armson, 2003). Because of

the trust earned by agreeing an intervention this makes the findings less prone to impression management and other biases (Alvesson, 2010). Longer periods of observation and involvement can help to develop trust and understanding, providing a researcher does not overstay his/her welcome (Alvesson, 2010). These biases are not completely removed of course.

Because each case was based on the design of an intervention using systemic PSM, some data were collected on an ongoing “live” basis, avoiding some of the problems of recall, where participants are asked about a past event . At other times, and especially during any review session, participants were asked to talk freely about problem solving in general and how complex problems are routinely addressed. In these sessions the potential bias of impression management and recall were more acute.

Other ways of conducting the research were considered but discounted for practical and epistemological reasons. First, large scale, extensive forms of research are often used to ask questions about “how many” and “how often” (Eisenhardt & Graeber, 2007, p.27). The temptation to apply an extensive form of research to find out more about application and adoption of systems thinking is questionable, however, when serious thoughts are given to the construct of systemic PSM. Even “Systems Thinking” is difficult to explain in a short space of time (Midgley, 2018). For Cabrera (2006, p. i) the “ambiguities of the systems thinking construct are central to the challenges people face in understanding and implementing systems thinking”. It is therefore difficult to have high levels of confidence in any study that attempts to measure a highly varied construct using an extensive methodology. There have been attempts to do this, Siriram (2019) for example. But his measurement of the construct assumes familiarity or awareness of “systems thinking”. No further definition is provided as to what systems thinking is and issues of reliability and validity are little discussed. It is more than likely that self-reporting respondents to Siriam’s survey will interpret the construct very differently. The same weakness afflicts multiple case study research of course, but the single embedded researcher has greater control of this potential problem.

Secondly, a variant of action research was considered as a possible means of addressing the research question but was rejected on grounds of practicality. The established norm in systemic PSM research is to collect case material with each intervention. Normally each case forms part of a much larger action research programme where experience accumulates over several years, or even decades, providing detailed knowledge about the development of methods and the process of intervention (see for example Eden & Ackermann, 2018; Checkland & Holwell, 1998). These approaches sometimes have spin-offs well beyond the refinement of method and knowledge of process. Eden & Ackermann (1998) for example document how their action research contributes to management theory (developing the theory of emergent strategy) and to the development of action research itself as a mode of inquiry. Outcomes such as these are only possible where a longitudinal study is possible. This is well beyond the reach of a novice researcher in the time available to prepare and submit a PhD thesis. Even though the action research method is beyond the scope of this project, the characteristics of "Research Oriented-Action Research (RO-AR)" as described by Eden & Huxham (2006) are extremely valuable as a yardstick to measure the quality of the conduct and outcomes of the research produced here. I will return to some of these characteristics in section 3.5.7.

3.4.1.2. On the writing of case studies: practitioner or academic

Ormerod (2014b, 2017) makes a useful distinction between academic and practitioner case studies. Ormerod's work sits within the OR discipline. His plea is for *practitioners* to provide more "informative" case studies of both "technical" and Soft OR "projects" using Pickering's (1995) notion of the "mangle of practice" as a framing device. These accounts of practice become data to help develop stronger theory about the process of OR, with the aim of filling in some of the "process lacuna" of OR practice (Keys, 2007 with reference to Checkland & Holwell, 2004). Ormerod's case study of Sainsbury (Ormerod,1995; Ormerod, 2017) provides an account of tirelessly overcoming several resistances encountered during the project which applies "soft OR". Ormerod uses creative ways to overcome such obstacles in what might be described by Pickering as the "dialectic of resistance and accommodation" (Pickering, 1995, quoted in Ormerod, 2017). This type of case study provides a finer-tuned view of what is going on when systemic PSM is deployed and is empirically

significant listing a number of objections to the PSM approach and how these are overcome *in the situation*. Ormerod (2017) makes no wider claim as to how these obstacles (and others) might supress or restrain the take up of systemic PSMs more generally, or indeed set reasonable expectations about their wider adoption in the presence of such obstacles. I suspect this is because Ormerod's main concern is with improving the efficacy of the methods and of intervention in general rather than with the broader issue of wider adoption. Nevertheless, Ormerod's introduction of the mangle perspective is highly relevant and is a reminder of how important the roles of consultant and researcher are when conducting this type of interventionist, case-study style of research.

In summary the term "case study" is widely used in systems and PSM research but covers a multitude of purposes, from single cases where findings are based on the personal reflections of the researcher, to longitudinal engagements involving several hundreds of applications. In the main, the object of this research is to improve the efficacy of methods and the process of intervention. The few cases that focus on the supposed "failure" of an intervention or those that report the struggles of intervention are in short supply. The main exceptions are Connell (2001) and Ormerod (2001, 2017), together with accounts of "frustration" and "disappointment" which occur alongside experiences of "great insight" in using SSM (Brocklesby, 2007). To my knowledge there is no *case-study research* that explicitly examines systemic PSMs for the uninitiated in the *context* of extant and preferred problem-solving approaches. This research here aims to fill that gap.

3.4.2. Theoretical sampling

Cases were selected on the basis that they were expected to yield results and be helpful for theory generation. This is because case study research relies on "*theoretical sampling"* (Eisenhardt & Graeber, 2007). Judgements were made to include cases that might offer up insights and surprise findings. This of course is difficult to judge at the outset, and sampling is also influenced by more mundane issues like timing and access (Miles, Huberman & Saldana, 2018).

An invitation to take part in the research (see **Appendix G**) was sent to various contacts known to me professionally, through previous consultancy engagements

and past employment arrangements. Only one case study materialised in this way. The other three cases were secured via referrals made by my contacts to others, illustrating “the strength of weak ties” (Granovetter, 1983). The sampling was strategic and purposive, meaning that cases had to be capable of connecting with the research questions. Some criteria for this are expressed in the invitation (see Appendix G) but are repeated here for convenience:

- Manager(s) in the case organisation have a “situation of concern” which is perceived as complex, strategic in nature and characterised by many inter-connected issues.
- The situation of concern is likely to have unclear goals and little or no consensus on what to do, or perhaps major disagreement on what should or can be done.
- The situation of concern is likely to mean that the problem has not be defined adequately or has not been adequately structured so that the next actions are not known or not clear

On the face of it this provided considerable leeway in finding suitable organisations to use as sites of investigation. Systemic PSM can be understood as a process of organised learning. This makes its (potential) application very broad according to some authors (see Checkland & Poulter, 2006, p.15 in relation to SSM). Sampling was also influenced by the prospect of working with larger organisations with perceived greater interdependencies, and smaller concerns who appear to be highly dependent on complex organisational networks, where interventions might span several organisational boundaries. A diverse sample was preferred in order to anticipate the potential demand for systemic PSMs from different types of organisation. Other influences were *manager curiosity* in wanting to know more about systems ideas and willingness to apply them. Aspects of “problematisation” (Yearworth & White, 2014) were important too, meaning a tendency to recognise that complex problems are difficult to define and there “isn’t a single ‘right’ answer” (Ackermann et al, 2020, p. 9). This accounts for some of the sampling decisions *across* cases.

Decisions *within* cases involved sampling live “situations of concern” deemed to be problematical (as above) and amenable to treatment by a systemic PSM. These

were determined by negotiation and constitute the “action agenda” for the research which is discussed in more detail below. Sampling decisions were also made about extant and previous problem-solving approaches where these were visible within the case organisations. In all cases, the perspectives of *senior managers* were sought. This includes director level, general managers, heads of service and owner-entrepreneurs.

Four cases in total were identified creating a diverse sample (see Table 3-2 below). Three others did not come to pass because of timing or judgements made by me – typically about the scale and perceived complexity of the “situation of concern”. One intervention was started just before the covid pandemic in March 2020 but was abandoned soon after. Some of the contacts who responded to the invitation politely declined, and there were others that did not respond, or responded too late.

Theoretical sampling is appropriate because cases are “suitable for illuminating and extending relationships and logic among constructs” (Eisenhardt & Graebner, 2007, p. 27). A summary of the cases and their sectoral characteristics is shown in Table 3-2. A summary of the problem contexts these organisations face is shown in Table 3-3 "Situations of concern" for the respective case study organisations.

Case Number	**Organisation Name († denotes alias)**	**Country**	**Organisational type and sector**	**Employees**	**Estimated Revenue**
1	CC†	UK	Local Regional Government	3000	£915 m
2	GMC†	UK	Charity	25	£1.5m
3	Canon Valve	Romania	Manufacturer (Publicly Listed)	50	€0.8m
4	Romflower†	Romania	Retailer (Private company)	110	€1.8m

Table 3-2 Some sectoral characteristics of case study organisations

Case Number	Organisation Name († denotes alias)	Managers	Nature of Complex Problem ("situation of concern")
1	CC†	UK	Devising a regeneration strategy for an urban neighbourhood in response to a political demand.
2	GMC†	UK	Deciding a charity's future in the fast-changing Mobility as a Service (MaaS) sector.
3	Canon Valve†	Romania	Restoring a manufacturing giant to former glories ("Making Canon Valve great again").
4	Romflower†	Romania	Creating a feasible and deliverable programme of improvement for a fast-growing retailer.

Table 3-3 "Situations of concern" for the respective case study organisations

3.4.2.1. Why these cases?

All of the cases described in chapter 4 meet the conceptual framework sketched above in section 3.4.2. Each case represents a particular juncture in the life of an organisation, where its senior managers face a situation of concern, which is perceived as messy, comprises many inter-related issues, and where there are disagreements, explicit or otherwise, on what could and should be done. Moreover, the managers in each case have some initial curiosity about what might be achieved through the application of systems ideas and systemic PSM. They are willing to learn about these ideas and methods, participate in their application, and encourage others to do the same. It is these characteristics that create some level of consistency across the cases, making them important *events* in which to study the acceptance or resistance to systemic PSM.

This is not to deny, of course, the important differences that can be observed in each case. Each organisation is embedded in its own economic, cultural and social environment, each case portrays managers of varying experience and background, two of the cases take place in Romania, and two in the UK (a form of convenience sampling); but what unites the cases is that they each record an episode, where senior managers engage in, and draw upon, relevant knowledge of systems thinking and practice with the aim of changing and managing a situation of concern (see

Coghlan & Shani, 2018 with regard similar characteristics in action research). As a result, they all portray similar evolving processes; processes that throw out new learning and understanding about the acceptance, accommodation and/or rejection of systemic PSM.

Selection and justification of the cases is therefore *conceptual* then. In the CC case, for example, (see chapter 4) there is surprise among a group of professional managers, when they are asked by city politicians to develop a strategy for a neighbourhood perceived to be in decline. The problem is ill-defined, there are a myriad of issues, and there is even disagreement about whether the neighbourhood should be a priority at this time. In the GMC case, a board of trustees and its deputy chief executive are concerned about the very future of the organisation and its general purpose. There are several options, but none have been fully articulated. The level of support that each option enjoys is unknown. In the Canon Valve case, a famous company has been turned around by a new management team. Satisfied with its achievement, the team would like to develop an investment plan for the future of the company and has received some positive signals of support for this from the parent company. But again, there are many issues to think about, there is conflict among some board members, and the timing of any proposal is deemed to be sensitive. In the final case, the owner-entrepreneur of a fast-growing luxury florist is frustrated about the lack of progress on many of the projects that the company wants to deliver. Some of the desired project outcomes have yet to be specified, and there is overt conflict about the method in which the projects are defined.

In summary then, it is argued that selection of these cases offers fertile ground for the potential development of theory about the acceptance of, or resistance to, systemic PSM. Inevitably, questions of access, convenience and geography play their part in selection, but the overall justification of the cases is advanced on *conceptual* grounds, with all cases meeting the criteria set out in section 3.4.2.

3.4.3. Some initial thoughts on *a priori* constructs

In “postpositivist” uses of the case study method conceptual frameworks are set out before undertaking subsequent steps in the research process (Lee & Saunders, 2017). In Yin’s (2018) version, for example, these come in the form of propositions

which are to be tested. In emergent or constructivist designs, they are not strictly necessary but can be included (Boblin, Ireland, Kirkpatrick & Robinson, 2013). For Boblin et al (2013) the question is one of striking the right balance between sufficient structure and openness to surprise findings. I have followed their lead. There has to be enough structure to guide the research and not so much that the study is blind to new insights and openings. Additionally, setting out initial constructs from the beginning and adding new ones or refining others, over time, shows the process of the research helping to support its quality and "recoverability".

Initial thoughts on relevant constructs come mainly from the literature, or gaps in the literature as articulated in chapter 1. These are listed below in Table 3-4. It should be noted that these are the *initial* constructs *before* the case histories have been fully compiled and analysed. They therefore represent a "first stab" at establishing constructs which guide the direction of the research.

Construct	Gap Y/N	Definition and Implication	Measurement
Preferred or extant problem-solving (PS) approach.	(Y) Extant approaches are rarely, if ever, referred to in systemic-PSM research	Recognised "in-house" approach to tackling problems that arise in the organisation or preference for PS approach (e.g. Quality management ethos, performance driven, ad-hoc, bespoke)	Frequency or circumstances in which participants assert or re-assert *preferred* PS
Expressed satisfaction with *extant problem-solving capability*	(Y) as above	Degree of satisfaction or enthusiasm for existing PS. Latent demand for systemic PSM?	Comparisons to systemic PSM intervention.
Use of formal or semi-formal *modelling* in extant problem solving and decision making	(N) key aspect in the literature	Production or presentation of model representing common understanding	Examples presented in the case
Difficulty in comprehending / explaining systemic PSM ideas, concepts, methods	(N) key aspect in the literature	Misunderstandings and/or challenges to the systemic PSM or process.	Recognised hesitancy, doubt, confusion etc. Clarifications sought etc. Direct verbal comments.
Debating broader issues and perspectives.	(N) key aspect in the literature	Different types of fora or exchange for debate. Not "thrashing around" (Checkland)	Frequency of for a, openness
Pondering	(N) Thinking DSPR (Cabrera)	Internalised "systems thinking"	Impossible to observe, requires articulation in interviews.
Seriously considering, seeking and finding out	(N) key aspect in	Capturing stakeholder views, evaluating, probing etc.	Frequency, format.

Construct	Gap Y/N	Definition and Implication	Measurement
stakeholders' views.	the literature		
Accommodation of a systemic PSM idea	(~) Some	Acknowledgement or acceptance of the approach	Review of PSM intervention
"Closing down" too quickly	(N)	Preference for action	Deciding to act (too hastily?)
Resistance to a systemic PSM idea	(~) Some	Resistance, challenge to process or legitimacy of outcome	Observation of process. Reaction to outputs
Ability to link concepts, ideas, relationships	(N)	Patterned thinking. System image. Theory-in-use.	Narrative explanation and "theories-in-use"
Demand for "different" PS approach	(Y) but often assumed and taken as given	Is there evidence that managers in the study are looking for new ways of PS?	Interviews. Evidence of frustration.

Table 3-4 Initial thoughts on constructs before analysis of the data

These initial constructs help to drive the research but constructs and their significance will be appropriately refined and re-defined by any emergent theory.

3.5. The Research Components

3.5.1. The research setting

The setting for the research is senior practising managers tackling complex problematical issues that pre-occupy them at the time of the intervention. The design also asks those managers to compare these live interventions with previous ways of managing problems, and "typical" or preferred ways of addressing problems. This may lack sufficient "specificity" for some case-study researchers. But complex problem-solving is an abstract activity and given its diversity there can be no sharper specificity than *senior managers addressing complex problems*. It is difficult to

narrow or delineate the research to specific “types” of problems (e.g., information systems problems, CSR problems etc.). This would make access to organisations more difficult and would typecast systemic PSM methodologies as if they were appropriate to a certain class of problem. Systemic PSMs are “technologies” (Keys, 1998), where defining the right problems and broadening the perspectives of those involved are part of the process. Starting from a particular *type* of problem contradicts this quality of systemic PSM.

The range of physical settings within which managers actually tackle, think about, define, re-define, consult, re-consider, and avoid problem situations is vast and would require a more intensive, time consuming (and intrusive!) ethnography. The settings are therefore restricted to the normal fare of boardrooms, offices, seminar rooms, and sat alongside individual’s desks.

3.5.2. Data collection

Data sources for the project include interviews with participants, documents, drawings, photographs, systemic PSM artefacts produced by groups, individuals or by the researcher, and observations. The different data sources are listed by case in Table 3-5 and Table 3-6.

Data Source	Case 1 CC	Case 2 GMC	Case 3 Canon Valve	Case 4 Romflower
Emails	✓	✓	✓	✓
Websites	✓	✓	✓	✓
Hand-written notes of observations (Researcher’s)	✓	✓	✓	✓
Unrecorded telecons	✓	✓	✓	✓
Hand-written notes/drawings (client’s)		✓	✓	✓
Risk registers			✓	
Statement of financial position			✓	
Income Statements			✓	
Spreadsheet data			✓	
Proposal(s) documentation	✓	✓	✓	✓
Annual Reports			✓	
Online consultation emails		✓		

Data Source	Case 1 CC	Case 2 GMC	Case 3 Canon Valve	Case 4 Romflower
Strategy day agendas		✓		
Summary options document		✓		
Organisational brochures		✓		
Summary document on trends (environment analysis)		✓		
Capital Project Process Diagrams	✓			
Project Management Governance Arrangements Policy	✓			
Quality Manuals			✓	
Project Tracker				✓
Organisational Structure Chart				✓
ITT documentation		✓		
Performance KPI documents (online)				✓
Programme Reports		✓		
Photographs			✓	✓
Wallcharts/ Boards			✓	✓
Observation notes of group meetings	✓	✓		✓

Table 3-5 Data sources by case

Systems Thinking "Artefact"	Case 1 CC	Case 2 GMC	Case 3 Canon Valve	Case 4 Romflower
SSM Rich Pictures		✓	✓	✓
Interim "systems" findings reports	✓	✓	✓	✓
SODA Group strategy maps	✓	✓		
SSM Comparison Tables		✓	✓	
SCA Decision Graphs		✓	✓	
SCA Option Bar Diagrams			✓	
SSM Conceptual models		✓	✓	✓
SCA Option Trees			✓	
SCA Comparison Areas			✓	

Systems Thinking "Artefact"	Case 1 CC	Case 2 GMC	Case 3 Canon Valve	Case 4 Romflower
SCA Uncertainty Areas			✓	
VSM models				✓
Systems findings presentation slides				✓
Commentary/Summary of Group Strategy	✓			
Causal loop diagrams		✓		

Table 3-6 Systemic PSM artefacts by case

3.5.3. Organising the data collection.

All cases were conducted serially, save for some slight overlap between cases 3 and 4. An additional case-study (case #5) was commenced towards the final stages of case #4, but was abandoned soon after because of the Covid-19 pandemic.

I kept notes for all meetings and audio recordings were made for the majority of meetings. These notes are scribbled into a number of notebooks and recorded on lose paper. They are about the managers who contributed to the research, their backgrounds, preferences, motivations, philosophies and outlooks. These managers are the "witnesses" to each of the cases. My notes on their mood, signs of impatience, expressions of curiosity or disbelief, are all of my making. I take full responsibility for these observations. Their value to the research is two-fold. First, they are hopefully helpful in making each case an "interesting story to read" (Ormerod, 1998). They are the raw material for the case write-up; to provide the reader with sufficient context, and therefore to help the reader with his or her own interpretations. I also took notes of the physical setting, again for the same reasons, to create a "vicarious experience" for the reader (Stake, 1998). Systems approaches are "learning for action" (Checkland & Poulter, 2006) and anyone concerned with learning, for example Stake (1998), will want to know how the physical setting influences the learning. Ackermann & Eden (2011) place a great deal of emphasis on the setting in their use of SODA. The second reason for keeping a rudimentary record of observations is that these can be re-visited, they can be compared to new readings of the interview transcripts, compared to new assertions and to emergent theory (Stake, 1998). They serve reflective practice. A checklist of possible issues to

look for in each case study was drawn up before commencing the research but was added to as each case was completed, reflecting the ongoing learning as the research progressed. The original thinking is set out in Table 3-7.

Behavioural observations	**Physical observations**
How curious are the managers I meet about systems ideas? Are the ideas (as explained) evaluated quickly?	What do the locations – offices, buildings, meeting rooms – say about the organisation and the managers?
Are there expressions of impatience about any aspect of the study?	What evidence is there of organisational structure charts, calls to action, KPIs? Are there any attempts to capture the "big picture" or the vision? How are these portrayed?
To what extent do those agreeing to the research involve others in discussions?	

Table 3-7 A preliminary list of observation elements

Details of the timings for data collection are provided in Table 3-8 below.

Case Number	Organisation	Anticipation (first contact)	Initial Meeting	Agreement of Study	Main Data Collection	Artefact Production (Models)	Discussion of Artefacts (Models)	Review of the Intervention (semi-structured interviews)
1	CC	Throughout 2016	3rd August 2016	3rd August 2016	16th August 2016 "Scoping Meeting"	16th August workshop (Decision Explorer model by 23rd August)	Informally 16th August More formally in "review of intervention"	26/11/2016
2	GMC	May 2017	12th June 2017	12th June	Tuesday 27th June "The strategy day"	Throughout June	Throughout June and leading up to the "key event"	12/11/2017
3	Canon Valve	25th October 2018	23rd January 2019	23rd January 2019	Phase 1: 23rd to 26th January 2019 Phase 2: 15th to 20th April	As per phases. SCA models completed in the period between phase 1 and 2	As per the phases	19th and 20th April
4	Romflower	19th April 2019	19th April 2019	19th April 2019	May 2019	April and May 2019	May 2019	July 2019

Table 3-8 Timing of Data Collection

3.5.4. Audio recordings and interview data

The primary source of stored data is digital audio recordings. Recordings were made of conversations about working into problems (defining them, understanding them, shaping them – the early stages of systemic PSM) and of more (formal) semi-structured interviews aimed at evaluating the intervention, discussing what was achieved and encouraging participants to talk about problem solving in their organisation more generally. In total there is 25 hours of recorded material. All material was transcribed for the purposes of further analyses. A set of general questions was prepared and circulated in advance of the semi-structured interviews, and this is attached as Appendix H.

Given recent research in behavioural OR, where the focus has been on collecting data on micro-processes of the intervention to learn about the process of OR (see for example Franco & Greiffenhangen, 2018), opportunities to record conversations as early as possible were taken. This gathers data about the process of *problematisation* (Tully et al, 2019; Kawalek et al 2003) and the "*selling*" of systems/ PSM approaches (Morrill, 2007 emphasis added). Usually, however, recording began on the second meeting when some degree of trust was established and an agreement for an intervention had been made.

3.5.5. Data analysis

Making sense of the case material occurred during the interventions, in quiet moments of reflection soon after the "action" was over, and in longer periods of sustained analysis following compilation of the material and the transcripts.

Data were analysed by bringing all the material together to create a case history for each case, which are re-produced in chapter 4. The material listed by case in Table 3-5 was synthesised into each case history. Where there are multiple respondents in an individual case (e.g., different managers and participants), comparisons were made to assess the level of agreement about the value of the systems intervention and about the strengths and weaknesses of existing problem-solving approaches.

Evidence was accumulated using within-case analysis and across-case analysis. No determination was made to do this quantitatively, but to do it by means of interpretation. The various “parts” of each individual case were examined to see how they are related. The detailed analysis of parts of a case – the people, the issues, frustrations, concerns, preferred methods etc. – were listed so that comparisons across cases could be made to create a firm basis for recognising case differences. A set of notation files regarding direct quotes, observational material etc. were kept on the basis of the a priori constructs and any “emic” issues (Stake, 1995) which came to light during the investigations and were judged to be interesting and pertinent to improving understanding were listed. The results of analyses are captured and presented in tables which appear in chapter 5.

Once the within-case analysis was completed, I looked for patterns across cases, and of course differences, comparing statements of key informants about their experience of managing complexity. The *content* of what is said is subjected to various analyses and interpretation cycles. The circumstances in which evidence and opinion is asserted are analysed. Analyses identified findings that are consistently repeatable in different cases but also found idiosyncrasies given the diversity of the cases.

As the analyses started to reveal patterns these were compared to assertions in the literature and to counter-assertions. As results began to crystallise, I began to think about suitable levels of abstraction for individual instances (Eisenhardt & Graebner, 2007) so that these could be incorporated into the emergent theory.

Luhmann’s complex social systems theory is used to provide a different theoretical lens in which to re-interpret the cases and this is introduced and justified in chapter 5.

3.5.6. Ethical considerations

Ethical approval for the research was conducted in accordance with Sheffield Hallam University’s Research Ethics policy (see ER12182332 Systems Thinking for the Uninitiated). All efforts were made to protect the anonymity, dignity and privacy of individuals participating in the research. All of the digital research

data has been stored on password-protected servers accessible by the author only. All of the hard-copy data is stored securely in a locked office accessible to the author only.

All participants were provided with their own copy of an information sheet outlining the nature of the study, an idea of what participants could expect and full notice of the opportunity to withdraw from the study at any point. The participant information sheet is attached as Appendix I**.** All participants signed two copies of the participant consent form (see Appendix J), one for personal keeping. Both the forms and the nature of the research were discussed each time a new participant was introduced to the study. Actual signed copies of the forms are in the safe keeping of the author. To protect each participant's anonymity the documents are not included in appendices. One participant waived his right to anonymity. However, I decided to anonymise this participant's contributions to be consistent with other contributors.

3.5.7. Quality criteria and limitations

This research design has three significant strengths. First, because of its intensive nature it overcomes some of the difficulties in creating mutual understanding of the systemic PSM construct. The researcher is placed inside the context of real-world problem solving, exploring in detail the relevance of systemic PSM to practising managers in four case study organisations. Secondly, the design explicitly recognises the intervention within the context of extant "in-house" problem-solving approaches, helping to generate theory about when systemic PSM might be used and when it might be consciously avoided or deemed inappropriate *vis-à-vis* other problem-solving resources. Finally, the design strikes the right balance between an open mindedness to "surprise" findings and a critical understanding of systemic PSM which helps to guide the direction of the research (Siggelkow 2007, p.21).

Nevertheless, it is important in this section to point out some of the limitations of this design and discuss some of the criteria by which the research can be assessed. This also helps to explain how the conduct of the research can mitigate some of its limitations. The three biggest limitations are:

1. The blurring of the research and the action agendas which are integral to this design.

2. The nature of theory generation in this project and the significance of pre-understandings.

3. The validity of the research findings.

In section 3.4 I drew attention to the work of Eden and Huxham (2006) and what they call “Research Oriented-Action Research (RO-AR)”. Their work focuses on research quality, rigour and validity, and whilst their work is firmly within the action research (AR) tradition its *relevance* to the methodology outlined in this chapter requires little argument. They set out 15 characteristics of AR all of which are difficult to achieve in actual practice but are key to observe in order to justify the validity and reliability of research results. I have been selective in matching three of their most important characteristics to the limitations listed above. Throughout the conduct of the research *all* of the characteristics can come into play. They can be used as a “test” by which research outputs are judged. This is very important because integral to most qualitative research is the requirement for a “high degree of self-awareness or reflexivity” (Eden and Huxham, 2006, p. 403).

In RO-AR it is vitally important that both the “research agenda” and the “action agenda” are suitably addressed. The action agenda addresses the case organisation’s “situation of concern”. If the action agenda slips in some way, *credibility* will suffer creating a risk to the research outcomes or distorting the findings in some way. If the action agenda is not achieved the case study organisation may bring access to an end or might shorten the project. This is an unavoidable risk of the research design. There was little evidence that this occurred in any of the cases, with each engagement coming to what was considered to be its natural end, governed by pre-agreed timings, deliverables and expectations. If, on the other hand, the research agenda dominates the action agenda this may create “alienation” of those involved, also undermining the research results. The interplay between both agendas requires regular reflection so that one agenda does not become too dominant. In some circumstances I made the conscious judgement to not pursue certain case

organisations that were suggested to me by contacts, believing that there was insufficient scope to satisfy the research agenda. In the cases that I did pursue I built trust and understanding early on. The research agenda was kept in the background when working with the participant as “client” (action agenda), save for when participants showed a curiosity in the research agenda. The research agenda was not allowed to hamper the action agenda.

The multitude of role expectations that emerge in a project like this one was plain to me from the outset as a result of my background. As a consultant I had useful experience to draw upon from commercial assignments in public and private sector settings. As a novice researcher, I had some experience of maintaining the desired focus on research aims and research question, without this being a bane for clients. Sometimes the "consultant" role called for more direction of participants in the situation, so that progress with the action agenda was not stalled; at other times, and usually following action, the opposite was required, prompting me to observe and listen more, and to prompt reflection in the participants, as they responded to my questions. Schein's (1999) typology of inquiry is useful in this respect. There are times when "pure inquiry" is necessary, when respondents are evoking relevant stories about their management of complexity. There is a time for "exploratory inquiry", when participants are prompted to explore the reasons for various actions, which requires a more questioning approach. And finally, there is a time for "confrontative inquiry", when clients and those involved may be challenged to think from a systems perspective and compare this with their normal practice. Depending on the situation, I used these modes of inquiry to address both the research and action agendas.

A second limitation of this research relates to the nature of theory generation and the way theory and experience determine observation. Critical rationalist approaches try to get around this by explicitly recognising theory and by testing hypotheses to destruction (Popper, 2014). Some versions of grounded theory try to eliminate any pre-conceived ideas about theory through meticulous analysis of the data. For me, it is inevitable that my own understanding, experience, background, and knowledge of theory will influence the research. I have attempted to “suppress any pre-understandings” (Eden and Huxham, 2006) so far as this is possible, attempting to keep open interpretations of the

data and to extend the possibilities of theoretical development. Theoretical development is an emergent process. This has imposed a duty on me to keep questioning the material in cycles of learning and reflection; a duty to be unbiased and critical, to maintain doubt and scepticism; to listen intently to the questions and concerns of those who manage complex problems and to consider methods of addressing those questions (Eden and Huxham, 2006). It imposes a duty to question one's own assumptions in light of the data, and to question assertions in the systems literature and any authority that has been "passed down". The research was designed to adapt to the circumstances and for theory to be emergent.

The third and final limitation addressed here refers to the validity of the research findings. Those of a more positivist persuasion are entitled to ask: 'are four case studies enough?' Case study research has the same challenges which face RO-AR, namely that theory generation is expected to occur from a "relatively small number of cases". In order to defend this stance, both Eden & Huxham (2006) and Checkland & Holwell (1998) stress the importance of "*recoverability*" of the research. What distinguishes the work of those using systemic PSM is that generally they should have a good understanding of the framework of ideas that they are using *before* they intervene in a situation. This is not the same as a hypothesis, but it is a set of ideas and theories declared in advance - in the present case articulated in chapter 2, and in the initial a *priori* constructs - which allows other researchers to "recover" or trace the steps of the researcher who is claiming knowledge. For this reason, it is important for a researcher to have a sound understanding of the framework of ideas (e.g. systems theory, the theory of systemic problem structuring methods); that these can be articulated transparently, permitting other (critical) researchers to evaluate the direction of the research (Checkland and Holwell, 1998). It is important to declare the methodology addressing the action agenda (how methods are chosen and mixed for the intervention); and finally take part in the action (researcher as intervener). Checkland and Holwell (1998) refer to this as F = framework of ideas, M = methodology and A= action. See Figure 3-2 below.

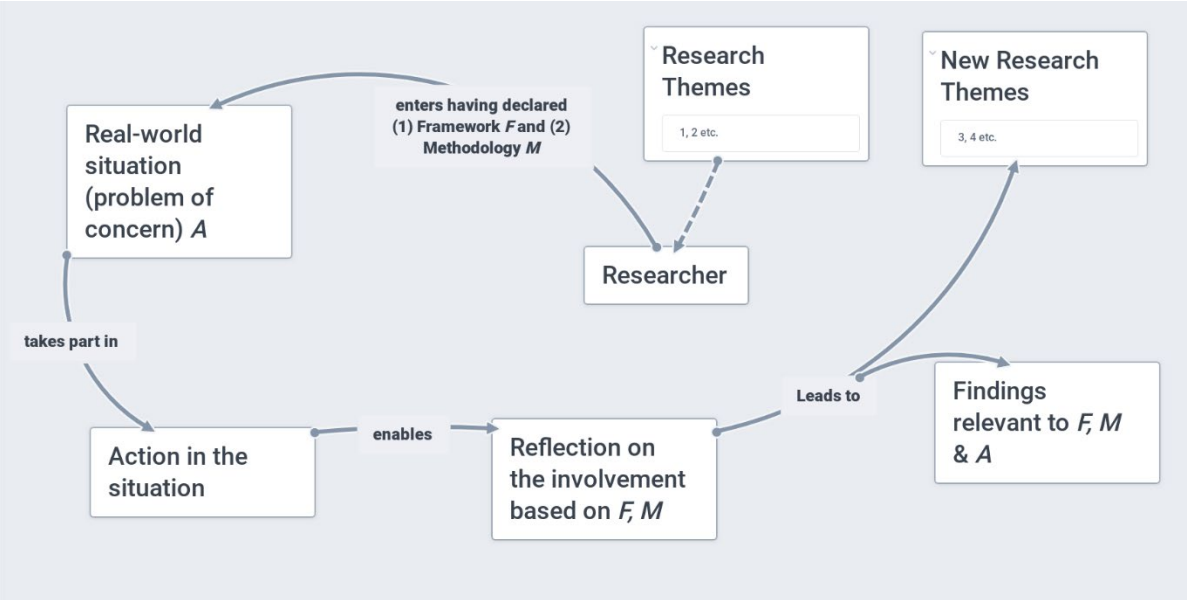


Figure 3-2 The cycle of action research (adapted from Checkland & Holwell, 1998)

To carry out any reliable qualitative research in this mode requires reflection on the learning related to F, M and A. This sets clear standards for the conduct of research and helps to defend the *reliability* of the research results. Eden and Huxham (2006) suggest that there is a trade-off between reliability and validity. If case study research and RO-AR is judged "solely" on the basis of positivist standards of validity then the research will fail. Siggelkow (2007) describes this error well by suggesting it is a "mismatch of methods and goals: to say something representative, you need to pick a different methodology". The argument here rests on establishing different criteria on which to judge the quality and validity of the research, such as adequate declaration of frameworks in advance, credibility, and recoverability.

3.6. Conclusions

This chapter has provided an outline of an intensive and flexible case study design aimed at addressing the question of how practising managers accommodate or resist systemic PSM. The aim of the research is to generate theory because there is no over-arching framework which explains why and when managers are likely to use or avoid systemic PSM. Many systems scholars assume that there is considerable demand for problem solving approaches which take into account broader perspectives which allow people to define and frame problem situations and problem improvements. However,

there are justifiable reasons to doubt this given the limited adoption of systemic PSMs. The sustained and focused period of intervention, reflection and discourse on problem solving, with the 4 case study organisations, will hopefully provide useful insights into the theory and practice of systemic PSMs.

Chapter 4 The Case Studies

4.1. Introduction

This chapter provides examples of systemic PSM in action. Four cases are presented. In each case the participants have no experience of systems approaches to management, they are, to all intents and purposes, the "uninitiated" of the thesis title. The aim of this chapter is to describe *what* happened in each case based on the intrinsic logic of the case. The aim of the subsequent chapter is to describe *why* the cases occurred as they did, and therefore looks to comparisons across all cases. These chapters, therefore, may be read as a pair. The main function of chapter 4 is to provide *a narrative description* of what happened. This follows Stake (2010) in permitting the reader to make "naturalistic generalisations", to associate the cases described with the reader's own personal experience of similar cases, and knowledge of other cases from the literature on systemic PSM.

The cases are presented chronologically, that is, in the order in which they occurred. And each case is described using the same format. First, some organisational background is presented. The aim is to provide sufficient context, to place the organisation in time, to summarise any relevant history and to provide a general feel for the difficulties and problems faced by senior managers or those who have influence over the problems. Then the broad *setting* is described, describing where the action takes place, the offices, the buildings etc. Following Checkland & Scholes (1990), and referring to the intervention, the key problem owners, would-be problem solvers and client(s) are identified. This is followed by a short section on why I was personally interested and involved in the case, and why I thought the case was important in helping to get a better understanding of systemic PSM. The remaining sections for each case describe the process of the intervention, including how problems were shaped and defined, how intervention methods were designed and chosen, critical events in the process, and the outcome of the intervention. Some preliminary reflections on each of the cases are made, which are expanded on in chapter 5. Describing the cases in this consistent format helps to support the process of cross-case findings (Stake, 2010).

In all of the cases described below consent for the research was obtained formally at or before the first meeting (see chapter 3 and Appendix J for more information). I provided each participant with an information sheet and a consent form, and these were explained. I also made my best efforts to define and explain the nature of systems thinking and systemic PSMs. I tried to avoid jargon and technical terms when doing this, and usually resorted to describing the adage “the whole is greater than the sum of its parts”. I also mentioned that systems thinking generally aims to be “comprehensive”, it aims to “sweep-in” lots of perspectives as a means of “capturing the whole” (Churchman, 1971); though I also emphasised the self-evident truth that no one can ever be fully comprehensive. I did not set undeliverable expectations for the work proposed, but I did say it is likely that some learning will take place and that I would be disappointed if the research participant (the client) does not get some kind of insight, however modest this may be.

4.2. A strategy for a neighbourhood – Systemic PSM in a city council

The City Council (CC), a pseudonym for one of England's largest city councils, is responsible for delivering all local authority services to approximately XXX, XXX local residents (the actual number has been redacted to protect anonymity). CC has a reputation for being one of England's most entrepreneurial city councils, but like all councils, it must make substantial savings to fund its key services because of falling central government funding.

One of those key services is housing and regeneration. The ability of the service to improve local areas in the city is subject to a whole host of complicated factors including national government policy, the economy, the private sector's appetite for investment, and local priorities determined by the locally elected politicians. Local priorities change frequently, depending on events and on politics. It is the job of the housing and regeneration service to respond to those changes and to do so within the constraints of limited resources.

When I contacted CC in 2016, my contacts – one in property services, the other in the housing and regeneration department – were managing a multitude of projects and initiatives. This is a "normal" state of affairs. There was a project to improve the way the council disposed of valuable assets, projects to improve various parts of the city, an initiative to reclassify properties in order to access more grant funding, collaborative projects with the council's arm's length management organisation (ALMO), projects to re-organise the delivery of new council house building. Alongside the housing and regeneration service's statutory duties, the list of work seemed inexhaustible.

The Council manages this work in its housing and regeneration service with what it considers to be routine practices: holding meetings with experts and specialists, accessing specialist advice to get legal opinion, briefing and receiving feedback from politicians, networking with other services, and keeping up to date with the profession. Was it possible that amidst all this work and practice there was some form of systems thinking taking place? Was some "putative PSM" at work? To what extent could systemic PSM be used to

successfully “front end” or shape a nascent problem in one of the city’s more problematical neighbourhoods? What are the prospects for, and perceived obstacles to, adoption of systemic PSM in the context of politically complex situations?

The observations below show how SODA was used to form some initial ideas about a strategy for a city neighbourhood, perceived to be in decline.

4.2.1. The setting

Like many large local authorities, CC has attempted to reduce costs by centralising many of its services. Much of the council’s administration – property services, regeneration, finance, planning, adult and social care, and others – are located under one roof, a vast office, or “headquarters”, on a site easily accessible by citizens. The reception area at CC is a bustle of activity. There is the sense that some key council business is getting done in reception. It is a large enough space for officers - the name given to public servants – to hold short impromptu meetings, in twos or threes, with visitors to the council. Access to the offices is carefully controlled. A security officer lets visitors through the turnstiles to meet greeters on the other side of the barriers; it is busy, lots of comings and goings. I am here to meet XX, the Head of Service for Housing and Regeneration, and ZZ, a Senior Estates Surveyor. I am greeted by a member of staff from XX’s team. The building is very modern; three glass lifts ferry staff and visitors up and down the six storeys of the building. From the lift it is easy to see the vastness of the office space, the clusters of desks. Employees at each level are busy at work, staring at their monitors, or engaged in conversation, in person and by phone. I am deposited in a large meeting room which could easily be a seminar room at a university. There are abundant whiteboards and supplies of marker pens and erasers. The tables are arranged into a conference format but could easily be reconfigured. On one of the whiteboards there are some ideas in the shape of a diagram, something from a previous meeting. The topic appears to be about safeguarding and social care. After a couple of minutes, XX and ZZ appear; they have rushed from one meeting and are quickly into the next.

4.2.2. Client, problem Solvers, problem owners

In the beginning, the client role for this case was uncertain. There were two possibilities: an intervention run by the property services department or one triggered by the housing and regeneration service. Initial contact was made with ZZ in June 2016. ZZ and I had collaborated before on regeneration projects, and shared an interest in the management of such projects and the contribution they make to improving communities and neighbourhoods. Several informal discussions were had about the running of the council's property services department and its wish to create a new strategy for delivering capital receipts to the council. A collaborative research project was proposed to ZZ. He made the decision to discuss this with his colleague, XX, who had a much more immediate problem in the housing and regeneration service; a problem that ZZ believed was more suitable to a systems study. As a result, XX, assumed the role of client.

XX, is an experienced manager who has worked in the profession of housing and regeneration for over 20 years. Most of that time he has spent at CC. Deeply respected by his colleagues and by elected councillors, he is renowned for his sharp intelligence, wit, and energy. He studied sociology at university, where his supervisors wanted him to stay on to do research, but he was “fed up with being poor” and declined their offer. He continues his interest in academic matters outside of his regeneration work, by being a member of a philosophical society and he regularly gives talks to universities. He considers this a hobby, or pastime. XX would also be involved in the problem solving. He has the authority to devote resources to this problem situation and ultimately will advise councillors on a course of action and decision. A number of other problem solvers were brought into the situation and are described below in section 4.2.4.2.

The range of potential problem owners in this situation is considerable. The two councillors who first articulated the problem are arguably the most significant problem owners. Their perspective is influenced by the residents they represent, who in turn will see the situation and its resolution very differently. Permanent residents, student residents, transient residents, newcomers, shop owners, councillors from different wards. All are credible problem owners, who

might easily have their take on the situation. The leader of the council and the portfolio holder for housing and regeneration – “senior councillors” – also have a vested interest in proceedings.

4.2.3. My interest and involvement

My perception of the types of problems managed by CC is that they resemble the types of problems amenable to systemic PSM. I had spent 4 years in an interim position providing consultancy to CC between 2008 - 2011, and I knew a little bit about the people who managed CC, and some of its politicians, though many of the latter had moved to new positions or had moved on. The overriding interest in this project was to investigate whether systemic PSM could be applied to an urgent matter that had arisen in the housing and regeneration service.

4.2.4. The intervention

The intervention can be described in two short phases, followed by a review. First a preliminary meeting to plan the intervention was held. The second phase was the strategy mapping workshop and the outcomes that flowed from it.

4.2.4.1. Phase 1: designing the intervention

In the first formal meeting brief details of systemic PSMs were discussed. A simple causal loop diagram and SSM model were used to illustrate the methods and how they might be deployed. The hosts immediately recognised the participative dimension of the methodologies I presented, and the conversation quickly turned to current live issues. Some recent issues had surfaced about an area to the northwest of the city centre, known as Area A. Area A is a mixed residential district with some smaller commercial enterprises (shops) and recreational space. Local Councillors had voiced their concerns about Area A and wanted to know what plans the city’s regeneration service had to improve the area, to deal with its perceived problems. Area A was by no means a top priority for the city's regeneration team, but even so it was required to investigate the matter and discuss appropriate actions it could take, subject to approval by elected councillors. The specific PSM to address this issue was to be chosen and shaped by the author.

Two further points were stressed by the client at this stage say something about the mood, or atmosphere, for “outside consultants” at this particular time. Expenditure on consultancy had been forbidden across the council. There would be no payment for the "consultancy" offered. This, of course, was not part of the research agreement, so did not present a problem for me. Secondly, the Council's regeneration service had been ill-served by "grand strategic thinking” in the past. It had commissioned several master plans, setting out visions for different parts of the city. These plans were subject to widespread public consultation and had created enormous expectations which were undeliverable. The plans were seen as being useful in theory, but “completely impractical because of the level of resources” and, because the public had been involved, there had been damage to the council’s reputation. These somewhat incongruous points appeared to say something about the attitude to consultancy at this moment in time. I took it to mean that the client wanted an intervention that was practical, something that might stand a chance of being implemented. This inevitably informed the choice of methodology.

Area A required an exploratory method, one that was able to deliver results quickly, one that could easily be understood by participants from different operational areas and one that was transparent in how operational considerations can link to strategy. For these reasons Strategy Mapping or SODA was recommended to the client. Strategy Mapping embodies participation. It takes advantage of the notion that if you bring a group of individual managers together, they will generally be engaged in making claims about what needs to be done to improve a situation or what needs to be done for an organisation to be successful (Ackermann and Eden, 2011, p.39. quoting Nutt & Wilson (2010)). The extent to which participant managers fully embrace the intervention will be dependent on a range of factors, including organisational politics, individual career ambitions and, not least, the quality of the facilitation. My experience of using Strategic Mapping was limited to low-risk applications used in teaching, or as a form of improvisation used in typical "away day" settings, where a plenary is split into smaller groups and where participants are usually inured to the tedium of the day.

I calculated It would be more time efficient to facilitate a group rather than collect participant's "claims" through interviews, translating the results into

cognitive maps, and then merging individual contributions into a greater whole. Using a group approach emphasises how participants can build on each other's contributions, to create a meaningful, joined-up strategy.

Midgley (2000) advises practitioners to not underestimate the role of intuition in designing an intervention. XX's regeneration team is very action-oriented, its members are very much familiar with working in multi-disciplinary teams and involving people through participation. The method chosen would not be alien to participants. Like many organisations, the council does strategy in numerous ways, sometimes rather dryly at the behest of important stakeholders in order to meet statutory requirements, and sometimes in response to local urgent issues. It is in the latter sense, where more telling actions are determined, where real activities are decided upon based on the collective expertise of the group. These considerations all supported the choice of Eden & Ackermann's (2011) Strategy Mapping which is part of SODA. The process for running the workshop was quickly agreed with the client by email following the first meeting.

4.2.4.2. Phase 2 – the strategy mapping workshop

Invites to the meeting were decided by XX and confirmed by email. The meeting was described as a "scoping meeting for the [area A] improvement project". A simple note implied that the need for the meeting was because of a request from the Leader of the Council and the Portfolio Holder for Housing and Planning. These elected councillors would not be part of the meeting, but its aim was to address their concerns for Area A, so far as these were known to officers. Invites were sent to:

PP, Housing Strategy Specialist, CC
QQ, Head of Asset Planning and Strategy, ALMO
ZZ, Senior Surveyor, CC
RR, Neighbourhood Development Officer, CC
TT, City Centre Coordinator with responsibility for business in the city, CC.

SS, a Senior Estates Surveyor, also joined the meeting on the day, as did AA, a new employee, and XX's new deputy. One officer, who was on the original invite list, was not available for the meeting. In total there were eight participants for

the workshop which is considered a near-perfect size for a strategy management workshop (Bryson, Ackermann & Eden, 2014). There was a blend of expertise in the group, but attendees were mainly from CC HQ. Later, I asked XX why the local ward councillors had not been invited and whether this is a good thing? XX replied: “perhaps they should have been, I mean, certainly local councillors… We allowed all of their NDOs (Neighbourhood Development Officers) who work very closely with them to get their perspectives and to articulate that at first.”

The meeting invites conferred "project" status on the issue, but the word was used in a casual sense and did not refer to the Council's detailed governance arrangements for projects and associated capital monitoring. The Council's "capital monitoring group” can include monitoring of project "concepts" with or without feasibility funding, but the Area A improvement problem was a long way from achieving such a status. Area A is better understood as a routine issue, normally in reaction to the Portfolio Holder’s concerns, concerns which may have been triggered through local ward councillors. Issues like Area A are unplanned and unpredictable, but officers have to respond to them and know how these enquiries fit, or do not fit, with regeneration priorities.

The workshop

Participants were sat around an oval shaped table facing the facilitator (the author) and a makeshift mapping canvas, 4 x 2 flip chart papers taped together arranged in portrait fashion and attached to a wall which was well lit with natural light. A full two hours had been set aside for the meeting. After introductions and some setting out of the context, this allowed around 70 minutes for strategy mapping.

Initial discussions expressed some disbelief about the extent of the problems in Area A. Officers of the council tend to have a much wider feel for the problems across the city, and so some areas are deemed to be more problematic than others, and there was some surprise that Area A was receiving this degree of attention. In an attempt to second guess the concerns of the ward councillors the participants sub-divided Area A into two sub-areas, P and M. This meant

that all concepts added to the strategy map would carry a suffix to denote whether the concepts applied to P or M.

Framing the strategy mapping session is vitally important, so consideration of the starting question deserves special attention. Participants were asked to think about:

> *The short-to-medium term issues facing Area A and what might be done to improve the area*.

The "rules" of the workshop were explained and set out. They closely follow the helpful scripts provided by Ackermann & Eden (2011) which, among other things, allow participants to contribute relevant statements or concepts to the strategy map without being challenged by others.

The workshop was productive in generating 67 statements in just over one hour. These were clustered around 7 themes (see Figure 4-1). All of the statements were numbered, and participants made some attempt to link statements into "cause-effect" or "leads-to" relationships, though the bulk of these were created by the author using Decision Explorer software after the meeting. The resulting map was sent to the client the day after the workshop and then distributed to all participants.

Linking statements is fundamental to check the causal logic, to create debate, to identify a comprehensive list of options and to detect emergent goals. Using computers to collect and present concepts is my preferred method, but this would require two facilitators, which was not possible. Legibility suffers if using a manual system and this is the reason why much of the linking was done after the meeting. It was done this way on the proviso that another meeting would be held to debate and confirm some of the causal logic, something that did not come to pass.

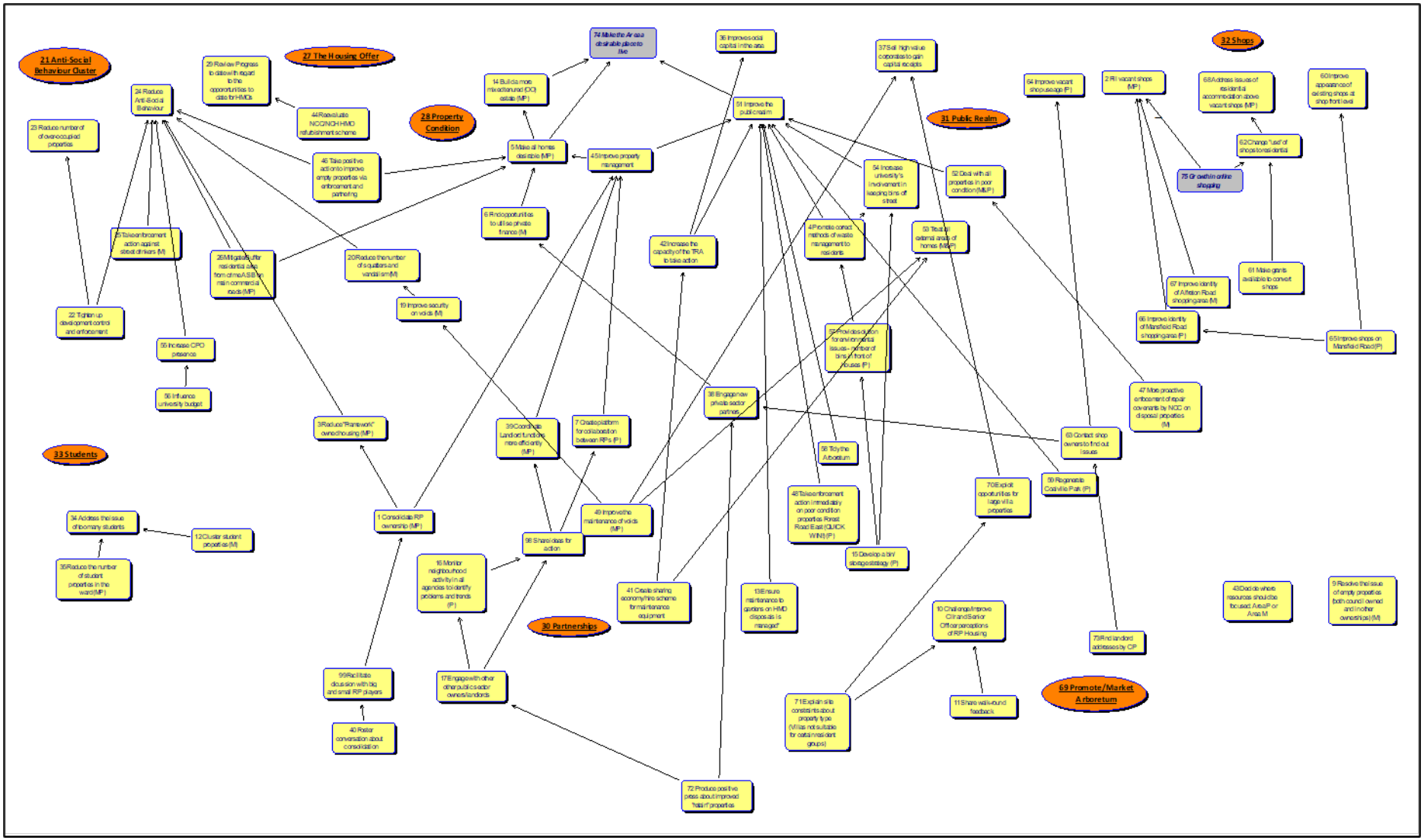


Figure 4-1 Strategy Map Created from the CC Workshop

The level of engagement in the workshop was very good overall, especially in the early stages. Participants fully engaged in contributing issue statements at the beginning. They spent time thinking and writing individual statements and observed the rules about not challenging each other's contributions in the early rounds. Several participants appeared to be genuinely interested in other's perspectives, seeking clarification, and understanding when this was permitted. Overall, there was a satisfying level of engagement.

There was one minor objection or challenge to the process of making strategy in this way during the running of the workshop. One of the participants (AA) commented:

"What's missing from this is the vision. I need to see the vision."

Vision is an important aspect of strategic management for many and is often seen as an important motivator. The counter claim is that visions are all well and good, but they do not say much about how the vision will be delivered and whether the vision is realistic. Ackermann & Eden (2011, p142.) recognise that some individuals will want to start with objectives and vision, others with actions that they feel need to be done for the strategy to drive some implicit goal. The former is associated with strategic planning or top-down thinking, the latter with emergent thinking. This comment ran counter to the client's wish that the session focused less on grand strategic thinking (and vision) and more on actionable strategies where some potential goals would emerge from actions to address short-to-medium issues. I reiterated the point about the expertise in the room, working from what actions need to be taken and then discuss the emergent goals.

It was agreed that I would translate the map into the Decision Explorer software and return to the client for distribution to the group. As I packed away the map and tidied the room the representative from the ALMO stayed behind to say: “that was a useful session”. There were other comments made by two participants over lunch, which immediately followed the workshop:

ZZ said: "That went much better than I thought it would go."

> SS said: "That would not have worked if we didn't have you [the author] as an outsider coming in to make it happen and do it the way you did. It just wouldn't work that way if we didn't have you as an outsider coming in…"
>
> ZZ added: "We have had training on things like this, we know this, and we can do it. But we don't."

4.2.5. Outcomes

"Action to improve the situation" is the general aim of any intervention using systemic PSM. This sets the bar for success quite low because *action* is interpreted very liberally and can mean any decision, programme of action, or indeed change in thinking, perception, motivation, impetus, ways of seeing etc. Any evidence of this could be seen as a positive outcome. Another way of looking at outcomes, however, is to ask: did the strategy workshop help to address the client's problem? And the answer to this is a qualified yes.

In the client's eyes the workshop led to two positive outcomes. First, it established a productive working group, which would continue to work on the issues at Area A. Secondly, the workshop helped to define important features of the problem situation; features that were central to how the problem might be handled.

There was sufficient reason to believe that the workshop had helped a little in energising the working group that XX had assembled. ZZ, who appeared to start from low expectations, said:

> "I felt that you managed to engage all the stakeholders in the room, and they were more engaged than I expected."

There was no second follow-up workshop, something which is discussed below, and something which was seen by RM as a missed opportunity:

> "I think by not following up, what we lost was the momentum that had been gained through producing this diagram [see Figure 4-1] in the first place. And through getting those

> stakeholders together and the enthusiasm, that surprised me."

Officers have a heightened awareness of the issues in Area A and a list of priorities. Some of these were easily worked up into formal council decisions and some could be implemented without seeking further approval from politicians. The workshop did not create a strategic vision for Area A, but this was never its intention.

One might easily argue that these same outcomes would have been achieved through a conventional meeting, but this overlooks some subtle, but important, differences. The first relates to bringing multiple perspectives to bear on the situation, and the second refers to "procedural justice" in the 'round robin' used to generate issue statements or concepts. The value of bringing different people to the workshop and the value in allowing each participant to write issue statements, without challenge from other participants, appeared to make a difference. I asked the client, XX, in the post-intervention interview: "How useful was the workshop?"

> "It was a useful exercise in the sense that you drew out some of the things and how they are connected. And, it emphasized some things and gave voice to some people who perhaps we've heard what they had to say, but they got to articulate it more clearly than perhaps we've done and given them time previously. And that changes our perspective on things. I think the hostel was the clearest example of that and how it linked in. We strengthened our understanding of those links."

The "hostel" that the client refers to appears in two of the concepts on the strategy map (see Figure 4-1) but the logic of its contribution to the problem situation is not fully developed there. This is one of the challenges of using strategy mapping and is widely recognised in the literature (see Ackermann et al, 2020). Facilitators have to manage both the *content* and the *process* of the intervention. The content – for example, the meaning of individual statements – will be expressed in the familiar terminology of those participants who are close to the problem situation, but this can be often lost on facilitators. The latter has

more interest in the integrity of the causal links and a desire to maintain meaning for *everyone* (including the facilitator); the former might be able to live with some ambiguity in the map, using tacit knowledge to make up for some flaws in the map. The danger is that participants might live with the flaw, on the grounds that they do not want to bother the facilitator with detail, but then begin to harbour doubts about the quality of the method.

The significance of the hostel was twofold. First, the hostel was a refuge for homeless men, widely perceived to live the most “chaotic” lifestyles. This would more than likely explain the perceived increase in anti-social behaviour and crime, and the perceived general decline of the neighbourhood. This has consequences for how the regeneration team could respond – for example improving the council housing stock or improving the public realm – and would likely to be ineffective because it would not address the root of the problem. Secondly, the growth in the number of homeless men, widely believed to be a consequence of welfare reform and austerity, was something that would reduce the “ownership” of the problem, taking it away from regeneration team and moving it towards police, health, and welfare expertise. For XX this posed a whole new dynamic to the problem situation, taking it further away from his sphere of influence.

There were some gains in learning for some of the participants. Earlier numbered concepts referred to a single registered provider (landlord), whose performance in managing tenancies was seen as inferior to other registered providers. It was a source of frustration and thought to be a contributory factor in the complaints about the neighbourhood. It was felt that reducing this landlord's ownership of property might lead to consolidation of registered providers in the area, something seen as desirable. Furthermore, it was felt that when the council sold off property, it could impose stricter conditions on the terms of sale through covenants. The effect of stricter conditions may prioritise sales to more responsible landlords, consolidating the provision. These claims on what could work were quickly assembled on the map (see the fragment in Figure 4-2).

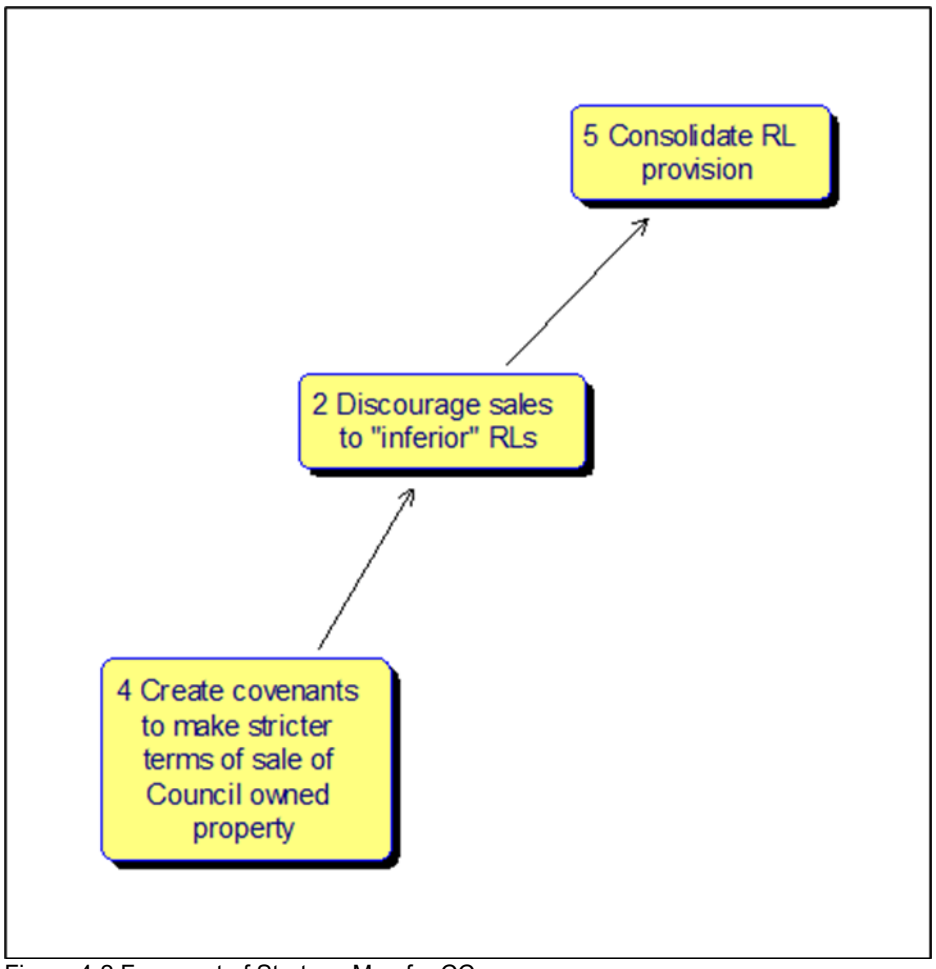


Figure 4-2 Fragment of Strategy Map for CC

Seeing the bigger picture on the map was useful for some of the group more than others. For those who were familiar with the kind of strategies shown in Figure 4-2 and those who had more experience, or seniority, there were few “surprises” in the map. XX commented:

> “I don't think there's any surprises that came out of it. It was not like we’ve really missed the complexity here. But on some of them we could have totally missed it rather. And some of them it was like, actually no, there's links here that we needed to give. We need to give a little bit more voice to a couple of people who were on the ground there, which perhaps we hadn't done. So, there was a very real positive outcome that came out of that.”

These are modest gains. There were other comments which pointed to some minor advantages of running the workshop by creating a strategy map. They also reflected a good understanding of PSM. ZZ suggested that the workshop

may have been more productive than a routine meeting: “the session that was facilitated to produce the diagram may have more quickly brought an understanding of the interrelationship of the issues than people just sitting around the table talking about it.” It also helped to challenge some siloed thinking:

> ZZ: “On reflection, I think bringing the stakeholders together to understand each other's points of view, understand each other's issues in the area and to some extent understand how their sort of siloed view is actually linked to other things that are going on there. I think a lot of them might say we've got a problem with prostitution in the area and some might say we've got problem with empty property in the area. Some might say, you know, we've got problems with drug-use in the area, but I don't think anybody was linking those together and saying, right, you know, these things all work together, to bring the area down, and only a comprehensive overall approach to sorting all these things out will bring about the step change that the council wants.”

Whilst the participants made many favourable comments about the intervention there were several criticisms. ZZ in particular struggled to differentiate strategy mapping from some of the training sessions that were the bane of his life 20 years ago. These training sessions regularly used post-it-note exercises to capture the thoughts, opinions, and suggestions of trainees. Contributions were clustered into themes, and facilitators promised to get back to the contributors with some form of summary, “but they never did”, according to ZZ. The use of yellow sticky notes was so ubiquitous that the council forbade their purchase in order to save money. ZZ eventually acknowledged that the causal links made the maps very different to the training exercises he had experienced, but the perception persisted and created a form of antipathy. He did not see any “novelty” in the approach. I had wanted to avoid this issue by using Decision Explorer software, but I did not have the multiple user licence. Post-it-notes were the only alternative.

In the follow-up post intervention interview, ZZ suggested that a second workshop would have been useful:

> "We probably would have benefited from another session whereby we talked about the links and understood them [a little more], it would have helped all stakeholders, and I think possibly the people on the ground more so than the people in the head office…"

I asked ZZ if he would consider using the strategy mapping method again. ZZ replied, "I think it could, but I wouldn't". Were there no benefits to be had in using the method then?

> ZZ: "No, there are benefits in it, but I wouldn't necessarily feel confident using it and making the relationship links that you've made. You've illustrated to me the strong possible benefits of using it, but you've not given me the toolkit to be able to use it in my view. Your role has not been to train me on systems thinking, it's been to use a systems thinking technique and see how effective it is, which it is."

Despite the perceived benefits of using the systems method, this participant would not try it again. It was a matter of becoming more confident in applying the method, but there was also a sense that the method had not been *endorsed*; it was not part of the routine methods that the council used – for example, meetings, agreed actions, project management techniques, monitoring etc. There appeared to be some conservatism about prescribed, accepted methods. I will say more about this below in the section on extant problem-solving approaches.

The most disappointing outcome of the intervention is that the *action* agenda came to an end after the first workshop. This was a personal disappointment for me because it would mean no further experimentation of systemic PSM in CC, though it did say something about the demand for systemic PSM, and perhaps the difficulties of adopting it alongside existing routines. Time appeared to be the main reason why the intervention did not continue; priorities too.

Both main protagonists – ZZ and XX – hinted that they would be interested in, or had at least considered, a follow-up workshop. As noted above, ZZ believed that capitalising on the momentum created in the first workshop was important, and the causal links for the resulting strategy map also needed to be validated. He said:

> "That's why another session would have been useful to highlight those links."

For XX, the first workshop had "focused the mind" but it "perhaps needed a little more than one session really to focus down into the detail". The client wanted detail but above all he wanted *action*, and so an action list was drawn up soon after the workshop and was implemented immediately. The client commented, "We didn't take the next step. And, perhaps we would have done if we did a pure or prolonged system theory approach." The implication was that the effort required to use a systems approach did not justify the perceived benefits that might follow. XX's team were aware of the inter-dependencies in the situation but had not "systematically documented" them in the way that the strategy map had done. But this would not get in the way of taking action. There are immense time pressures at CC, and these can sometimes be the enemy of thorough and useful analysis. But these time pressures are real, and other problems emerge if results are not achieved. Officers must be seen to be achieving results. Priorities and the need for decisive action were the main reasons why the intervention ended after just one workshop.

In summary the intervention at CC was only moderately successful. Some of the participants got more out of the workshop than others. It made a start to some work streams. But it also showed some of the difficulties in implementing systemic PSM, and provided some clues as to its likely adoption or resistance which receive closer inspection in sections 4.2.5.1 to 4.2.5.3.

4.2.5.1. Extant problem-solving approaches (PSA)

The housing and regeneration services' general problem-solving approach (PSA) is to hold meetings in response to issues which might be raised by politicians, officers, partner organisations, or the general public. These meetings try to define the problem, they try to establish "what can be done?", "what is the

plan?", "what is the strategy?", and they take into account the views of stakeholders. CC employees use the term "project" to describe this kind of work. Virtually everything seems to be a "project" (CC Gateway Document, 2016). Indeed, Area A is a "project" and this is before it is actually worked up into some formal decision and recognised as a bona fide project, monitored under some broader capital projects programme. The language of "projects" is everywhere. It is a catch all term to organise (virtually) all of the work. As soon as the ideas in the meeting crystallise into an (in)formal project, actions are assigned to individuals, follow-up meetings are scheduled, actions are monitored and reported on, problems emerge and are decided upon. The cycle is repeated. I ask ZZ about documentation: "How do you record the decisions from your meetings?" ZZ says:

> "A report. That would be a common output from a project team, a report of some sort."

In our discussion we compare a typical meeting report with the output from the area A workshop, i.e. the strategy map in Figure 4-1. ZZ displays a good understanding of systemic PSM and comments:

> "I think there's a big difference because this diagram identifies the interrelationships between all the factors, which as I say is very difficult to do in words. Without a lot of words, and the scope for confusion, this is pretty clear really, if you know what you're looking at and particularly if you had training on it to be able to produce it and understand it."

I ask whether there are occasions when participants in a project create some kind of visual model, a simple word and arrow diagram to represent the problem, or some aspect of the problem. ZZ replies bluntly: "There's not any occasion". Project management techniques, formal reporting and formal records of meetings are so ingrained in CC's culture it is hard to see how any form of systems model building could take root. ZZ can see the value in creating models but feels they are time consuming. He recognises the contradiction in his own response:

> “I'd feel comfortable giving it a go [strategy mapping], but I think it would be time consuming. It is time consuming. And you’re back to that time pressure thing. And I'm sort of identifying my own priorities if you like. And I think that's a problem. If we had more time to do more stuff like this, then you might get better results quicker, which is sort of a contradiction. But as you know, people feel comfortable in their silos and I can fully see how this might lead to better results ultimately.

There is a sense of conservatism in this participant’s response. It would be difficult for the organisation to adopt some form of systemic PSM without the endorsement of others, perhaps from a senior leader like the Chief Executive.

There was little sense of disgruntlement with the established ways of tackling problems. ZZ felt there was a “silo mentality” at times and that “stakeholders aren't being effectively brought together.” XX complained that there was often “linear thinking” among some individuals. He concedes that taking a more holistic view would help to combat episodic “linear thinking”, which in XX’s opinion sometimes takes a grip of various actors working for, or on behalf of, the council. He explains a recent case in which the CEO of an ALMO is buttonholed by a councillor who tries to persuade the CEO of the need to re-develop some shops into housing. The CEO says, “I’ll deal with it”, and puts in chain a series of meetings to design the scope of the project and the range of interventions. There is no debate about whether this is the right thing to do. XX judges that the proposal will require extensive resources and will have minor benefits at best. XX suggests: “So this is where, this sort of thinking [systems thinking] helps” because it will systematically map out the other problems and unintended consequences of the councillor’s pre-determined solution. But XX refuses to commission some kind of formal systems study or modelling exercise in order to change minds, he instead throws a whole range of factors into the situation:

> “I suppose what I'm doing there, although it's not as systematically as you’re doing here [referring to the strategy map for Area A]; the way I've resisted it is by throwing in a

> whole range of holistic, more chaotic factors into it, to say the problem with that area is much, much bigger and more complicated and your predetermined solution to that problem is going to take lots of time and money, and isn't going to deal with the problem anyway"

XX uses intuition to quickly assess and evaluate plans and strategies, and then he "blocks" those that will not work or will waste resources. He sees a difference here to the brief systems experiment we conducted for Area A. "I suppose there's an element of wider holistic thinking that comes into it. Although essentially my answer isn't to tackle [the problem] in a *different way*, we have to *not tackle it at this time* because of *priorities*." A prolonged systems study might have the effect of kicking things down the road to thwart a bad plan, but this would cost more than a strategy to "block".

Another form of problem-solving approach, or inquiry, that is practised at CC is something called "deep thought sessions". These were started by the corporate level director for development. They are a chance for senior employees to take stock of something that the council are deeply embedded in. They are infrequently held, "perhaps 4 or so over the last year" (XX). They take a broad topic – Housing for example – and according to XX they ask: "are we happy with the things we are focusing on?" They are an opportunity for reflection and to think through the wider implications. They are open discussions. Portfolio holders, are invited as are key people from all areas of the organisation including support service directors like HR. The corporate director gives some basic headlines about the topic and then invites discussion about whether the council is doing the right thing. Usually this results in some minor modifications to strategies and plans, not "wholesale change". "How is it documented?", I ask. XX replies:

> "Good question. There were minutes of the meeting done. And then there are key actions. The aim of it is, is to either confirm that we're happy with the things that we're doing or alternatively to say, actually we need to take a different approach on this. Or the middle way is that we need to add in

> some new additional lines to what we're doing in order to tackle things that we're currently missing that are important."

XX finds these meetings reassuring because:

> "There's a lot of bright people at the council and a lot of people involved in the day-to-day management of projects, who are very good at thinking about a lot of the core dependencies, and mapping those, and recognizing where there's going to be wider influences. They sort of do that as *a matter of course* and they are the best people who do well at project management thinking…putting it in a context, rather than just being driven down a particular route." (emphasis added)

There is perhaps less need for formal systems modelling when the wider thinking can be achieved by bringing "bright" people together, to form a synoptic view, collectively and quickly, and where the thinking has been done as a "matter of course".

4.2.5.2. Internalised systems thinking?

To what extent might the invitees to the mysteriously named "deep thought" events be practising some form of internalised systems thinking? Not actually following a prescribed process but interpreting the flux of events through some form of thinking that questions boundaries, considers different perspectives, sees various levels of complexity, and ponders different relationships. This would be impossible to find out, not least because I had no access to a "deep thought" event. But I could ask XX how does he "see" all of the problems and inter-dependencies he claims to see, for example when he quickly blocks the proposed intervention by the CEO of the ALMO (referred to above).

> "It is about sitting back and seeing the bigger picture. I'm very aware at times that there are things that motivate me individually, and there are things - sort of mantras – that I tell myself for my day to day thinking. And I suppose with having a philosophical background, one of the things that comes out

> of that is to a question your assumptions, the whole sort of ability to recognize when you're deconstructing something, when you need to step back and actually think, hold on, is this assumption based on something sound, am I clear about this? And I think because, I've done quite a lot of that in my own thinking - I am used to thinking like that - I do at times, even when I've got quite strong views about things, I stop myself and think, right, hold on, I can see why it's motivating to do this. But are there any reasons why I'm missing some wider perspective here? Am I missing the boat here? You know, missing the point here where some other people are coming from. Do I need to think a little wider about this? Are there things that are outside my current way of looking at this? So, I do have times when I quickly, have a double check on what I'm doing, and I do that quite systematically and often I suppose, not necessarily in a group meeting where I write it down, but in my own head, you know, I sort of try to shift perspective and look around something a little bit more."

If this is a form of thinking that comes close to "systems thinking" then it is possible that, without sufficient and nuanced understanding of others' perspectives, insights and potential improvements will be overlooked. This appears to be a smaller risk than delaying action for XX's housing and regeneration service. XX is happy to cite projects (led by others) where taking different perspectives into account was taken more earnestly. He tells the story of a development site located north of the city. Initially, the former MP, who has some say over the site, insists, against all the advice at the time, that the site should not be developed for new housing. But after some time, the MP comes to accept that nothing else apart from housing will be built. He drops his resistance. But then he demands that there is something "special for the site" and invites numerous interest groups to come and help with the design.

> "There are groups who want a community garden, some want permaculture, some want wonderful architecture, some want co-housing. Examples are presented of things that work in Sweden… And they all had different visions about different

> ways of doing things with different priorities. And it just created a monster. It was an absolutely monstrous thing really because what you had, rather than having a sitting down and saying, it was the opposite of this [the systems intervention] in some ways, but it was very like this [the strategy map] in the sense that you had lots of people coming and talking about the problem and trying to think about it. But in another way, it was the opposite of this [the strategy workshop] because what you had was you had tons of people who all thought they all knew and added to the agenda."

The development that XX refers to has still not got planning position (after several years) and in the words of XX has become "bogged down". As mentioned above, taking decisive action is deemed important.

But this might not be the only reason for limiting participation to something more reasonable. There may be other reasons why internalised systems thinking is more appropriate in circumstances where politics makes a big difference.

4.2.5.3. Layered political complexity

XX had further reasons to doubt the appropriateness of systemic PSM in CC's context – the subtlety and levels of complexity involved in council work. Problems are complex in multiple ways:

> "The problems that we're dealing with are complex in that they're set within a network of factors, which if you say, right, this is the problem and what are the things influencing that problem? But on top of that, then, there's layers of political complexity which adds to that [complexity]. Because there are political demands in terms of what we as an organization can do, and what people want to do, and what people want to give [their assent to]. There's political complexity in terms of the internal politics between the organizations involved and there's a level of complexity as well which is to do with which of these things we do, and where do we want to push on."

Knowing something of the politics, knowing when to “push back” and challenge positions at the right time and in the right circumstances, and knowing when to “just let things go” are vital aspects of managing housing and regeneration issues for XX. An external consultant can only be so useful.

Some political dimensions of the work are known to many, or are known to those who know, but are never spoken about openly. This would cast serious doubt on methods that tried to open up perspectives, model causal relationships, interrogated and challenged worldviews. The methodology would be risky, dangerous:

> XX: “I’ll tell you why it makes things complex in terms of a process like the one we went through because: (1) there are the level of dynamics above the project in itself and (2) it’s hard to articulate them in a process where everybody’s involved in it. Because some of the whole point about these things is that it cannot be spoken of without offending people, it exposes people a little bit too much to motivations, which you know are going on, but which people wouldn’t admit to. And because of that, it’s hard to map them in a way that you can then present to people and say, Oh, actually here, this is the political dynamic on top of this, because it’s just far too subtle.”

XX refers to a number of anonymised examples to support his claims about political complexity. One example involves two councillors who have had a “political falling out”. One councillor has his heart set on a single big important project. His aim is “declutter” lots of smaller projects which take the focus away from his one big project. In doing so he tends to accept some minor projects without objecting to them. At the same time, his rival’s strategy is to “clutter” the project list. The rival is trying to “crowd it out in terms of what the overall financial situation is by throwing these other things into the mix. Now that’s very difficult.”, LH says. The implication is that we can no longer just focus on projects or problems “in their own terms”, because in CC’s case there is another level of complexity above the problem situation which perhaps ‘dare not speak

its name'. This further limits the range of conditions for which systemic PSM is appropriate.

4.2.6. Summary

The intervention at CC was short-lived. Its contribution to the "action agenda" was modest. There were mixed reactions among some of the participants. The intervention began well, and there were good reasons to think a longer study would have been beneficial. But there are many sound reasons to suggest why systemic PSM may not be appropriate, except in very specific circumstances. This will have inevitable consequences for any hope of its wider adoption. At CC there is reasonable evidence of faith and confidence in existing routines and practices – the meetings, action agendas, project management techniques. These practices do not always work, but they work most of the time. There is a conservative attitude towards current practices. Systemic PSM assumes a candour which cannot be taken for granted at CC. Indeed, systemic PSM might be seen as naïve in view of the layers of complexity which appear to be present at CC. An internalised and private form of "seeing the whole" may have emerged for some officers because of this complexity.

4.3. Seeking good mobility - Systemic PSM in a charity

The “transport system”, widely defined, is a matter of everyday life and is generally recognised as a key enabler of economic growth, moving people and goods, more-or-less quickly, safely, efficiently, sustainably, depending on one’s perspective. In the case of personal travel, each of us tends to know only a small part of this vast system, finding a mode of travel, for example, bus, train, private car, cycling etc., and habitually sticking to it. But the “transport system” is constantly changing and innovating, and there are a myriad of organisations helping to shape its future direction. Some of these organisations want to make the “system” more sustainable. One such organisation with this aim is a small UK-based charity called Good Mobility Charity (GMC), a pseudonym, established 19 years’ ago, with an ambition to rethink the role of the motor car, and to develop and encourage more sustainable forms of travel, through a concept known as "shared mobility". This is an umbrella term which refers to shared transport modes, including car sharing, ride sharing, e-scooter sharing and bike sharing. When I first came across this organisation in 2017 and was introduced to BB, its deputy chief executive, I was told it was facing a major dilemma: whether to continue its work in car sharing and car clubs. This had been a major part of its mission going back to the early 2000s, but there was a feeling that the original purpose, for car clubs, had been met, and that the services it currently supplies in this area might well be better delivered by another party. In short, GMC was considering whether to divest this part of its operation. The pressing questions were: Was GMC’s board of trustees ready to make this decision? What would be left of the organisation if it ceased operating in car-sharing? How would the organisation continue to be involved in the emerging Mobility as a Service (MaaS) sector, which covered a multitude of shared transport modes including shared cars?

It was in this context that I was asked a rhetorical question by BB: "What would a systems thinker say?" I took this as an invitation to frame an intervention which would illustrate “mode 2” systems practice where the "stream of ideas and concerns" is interpreted using systems ideas and tools (Checkland & Scholes, 1990). Would systemic-PSM help a charity director get a clear-eyed view of her organisation’s role in the growing MaaS sector? Would it help to

structure some of the key issues, so that the board of trustees could make a decision? How would the charity director respond to using systemic-PSM? Could she be persuaded to see the ideas and tools used in other settings?

The observations in this case study point to a would-be user with a strong action orientation because of perceived and real time pressures. This meant a fast application of systemic PSM. It was early June (2017) when I first met the client when she asked me her rhetorical question. Her board meeting was scheduled for the 27th of June. This was the date the board of trustees would decide the future of the organisation.

4.3.1. The setting

GMC's main office is situated in a northern city just 5 minutes' walk from the city's busy railway station. The office is on the first floor of an attractive, refurbished Victorian building; a building shared with other businesses: legal firms, media enterprises, and recruitment agencies. A restored, wrought-iron staircase leads to the first floor. All the offices look modern and fashionable. Inside GMC's space there are two main rooms separated by a tall thick wall. A large arch has been cut into the wall to create a link between the two rooms. The first room is a meeting area with a large oval-shaped table which could easily accommodate 8-10 people. In the second room there are 6 to 8 white desks, with computer screens and the usual office paraphernalia. The rooms have high ceilings and the high windows let in plenty of natural light, making the office feel airy and spacious. I am introduced to a project coordinator and to the finance manager by BB. I learn that the offices are used as a base for now, but in time the organisation intends to surrender the lease. "It's just not worth it anymore", BB says, "most of us work from home these days, we are a virtual team, if we are needed for meetings in London or elsewhere, we can just travel." Part of the team is in Scotland where the charity leases a second office. The Scottish based employees rarely come south, funding for their projects comes from the Scottish Government. The client says: "The funding rules are pretty tight up there, which makes their projects pretty independent." There is plenty of shelving in the meeting area. Glossy publicity from previous campaigns with images of active travel sits side-by-side with more formal looking, spiral-bound reports. The floorspace is taken up with roller banner

stands, cables, posters, and tote boxes. We sit down at the conference table so that BB can tell me more about GMC and its current issues, and I can explain a little more about systems thinking and systemic PSM. I made 2 visits to GMC's offices during this intervention. First to find out about the organisation and its issues, secondly to explore some of the early systems models. The next time I met the client was at a board meeting event, to which I was invited as a non-participating observer. The setting for this is described under Appendix K.

4.3.2. Client, problem solvers, problem owners

The client for this case is BB, the deputy chief executive of the charity. She is second in command, something of a stalwart in the transport or mobility sector, having worked for the charity on two separate occasions, once as head of the charity. The intervening period was taken up with raising a family together with some part-time work which allowed a degree of work-life balance. She holds degrees in psychology and environmental science. I ask what her speciality is, she responds: "I'm a general manager, but I suppose I have a keen interest in behaviour change".

The potential problem solvers and problem owners in this case are many and varied. At the outset, the problem situation seemed straightforward, especially when it was couched in the language of decision: Should GMC divest its car-sharing activities? It is a question that the board of trustees would discuss and decide at its upcoming meeting. But it is also related to two other concerns. First, if the car-sharing and car club activities were discontinued what was GMC's purpose? Secondly, the chief executive officer, AA, had expressed his wish to step down from his role in the near future. He had shared this with certain trustees and with his deputy. Nothing had been decided, but there was considerable uncertainty about the changing purpose of the organisation and its longer-term leadership. As the potential issues increased the more potential problem solvers and owners became apparent. There was considerable time pressure and the client wanted this to be a limited intervention. So the number of problem-solvers and problem owners would also be limited, save for their legitimate role as trustees. The deputy CEO was keen to know how she could use systems ideas to help with *her own thinking* about the impending decision.

4.3.3. My interest and involvement

The intervention came about somewhat opportunistically. The client, BB, is frequently contacted by active researchers from academic institutions, asking to collaborate or to provide data. There is great interest in the shared economy concept and in shared mobility. The vast majority of these requests are politely refused. GMC would be overwhelmed if it did not decline them. My access was through personal connections and would be limited because of time:

> “I get contacted probably every week with some kind of request from an academic or a student… a researcher of some sort. And we just don’t have the time… We refer students to the website and the DfT (Department for Transport).” BB

The prospect of learning about how this organisation tackled messy problems was attractive to me, not least because of the organisation's culture and its connections to other organisations. GMC is a spontaneous, self-organising group of individuals sharing a common mission, and is unburdened, to some extent, by bureaucratic norms that may affect patterns of thinking in traditional public sector organisations, like the example of the council in the first case study. Would this context make it more suitable for systemic PSM?

Culturally, the organisation appeared to be different. The CEO of the charity had – according to BB - joked in preparation for a recent staff strategy day that:

> "anyone [of his team] who mentions Prince2 during the course of the day will be immediately dismissed." AA

There was good reason to believe that the organisation might be less orthodox than most, and that their thinking and practise might be more open to systems approaches to management. The disciplinary backgrounds of staff and board members - fluvial engineering, environmental science, geography, town planning - would perhaps mean potentially substantial experience of "knowledge about systems" in the sense employed by Cabrera (2006).

A final reason for interest in this case can be traced to the complexity and dynamism of the sector. New technology creates numerous ways in which

travel options can be assembled. Disruptive change occurs as entrepreneurs keen to capture personal data invest heavily in launching new bike-share schemes in various cities worldwide. Social attitudes change, and the impact of transport on air quality and health is of great concern to local and central governments. GMC has to plot its future in this turbulent environment, creating new partnerships in order to sustain its influence and address the priorities which support the charity's mission and purpose.

4.3.4. The intervention

This example of systemic PSM is best described in three phases which mirrors the course of the intervention. First, a finding out stage about the recent history of the charity and how it had come to see its current decisions and choices. This included some “quick and dirty” systems modelling to explore some possible futures for the organisation that had recently been aired by both the chief executive and his deputy. Secondly, and as it transpired, in keeping with the client’s wishes, systems thinking was used to investigate the *process* of how the board would make a decision about the charity’s future. Here the emphasis would be on the *intellectual process* that the board takes in making decisions. However, the *content* of the problem situation in phase 2 was not entirely abandoned, because the client wanted to take soundings from board members in response to a specific question in advance of the board meeting. The responses were collected, and a virtual strategy map was created for the board meeting. Phase 3 contains my observations of the board meeting, which I was invited to as a non-participating observer. At this point the client could compare her preparation for the event – e.g., the systems model – with her perceptions of the actual event.

4.3.4.1. Phase 1 - Finding Out and the Content *of the Problem Situation*

The charity aims to educate and influence the way people travel, to reduce the environmental impact of transport, and to improve access to transport for those who may be excluded or disadvantaged by limited travel choices. GMC promotes car sharing, car clubs, bike sharing and ride sharing. It provides accreditation of car club and bike share “operators”. These are often private companies and sometimes social enterprises run by social entrepreneurs.

Accreditation is recognized by the Department of Transport and by Local Authorities and is often a requirement for the license to operate a shared mobility scheme. The charity works with a diverse range of stakeholders, all of whom seek to shape policy for shared mobility. This includes government, shared mobility operators (entrepreneurs), automobile manufacturers, transport consultants, trade bodies with similar ambitions for shared mobility, and technology companies too. With 10 full-time employees and an annual income of £0.6 to £2.0 million, GMC provides research on the social and environmental impacts of shared mobility, technical advice and consultancy, it helps to design and shape pilots and development projects for state-of-the-art mobility schemes, accredits car, bike and e-scooter share operators, and provides advocacy and partnership working in order to promote the notion of good mobility. Advocacy is the common thread here, and it is advocacy that drives the charity's public benefit.

At the time of my involvement the organisation was giving serious consideration to its future direction. GMC had championed the idea of car clubs for as long as it had existed as a charity. Nineteen years ago, very few people had even heard of car sharing clubs, let alone understood the concept. Early operating models were run by social enterprises who, with GMC's help, had struck agreements with local authorities to create designated parking bays for small fleets of car club vehicles. The cars were accessed by registered car club members using a smart card. They attracted users who had a need for a car for occasional use but did not want to own their own vehicle. They are in effect short-term hires. Over the years the operating models were gradually improved. GMC provided advice to those who wanted to start a car club and collected all the learning that was produced by running one. It also formed partnerships with local authorities and the DfT. It championed the cause of car clubs and accredited the operators. Small car clubs were swallowed up by entrepreneurs. Operators started to grow in size and bigger players entered the industry including Zipcar and traditional rental firms like Enterprise. As the chair of the board of trustees put it: "Car clubs are mainstream now."

There was discussion of the charity's links with other bodies including government (local and national); motor manufacturers; operators (of shared transport schemes); the Community Transport Association (CTA), a charity

representing providers of community transport; and the British Vehicle Rental and Leasing Association (BVRLA), a trade body for vehicle rental companies. Some of these organisations were captured in the rich picture which was beginning to emerge see Figure 4-3 below.

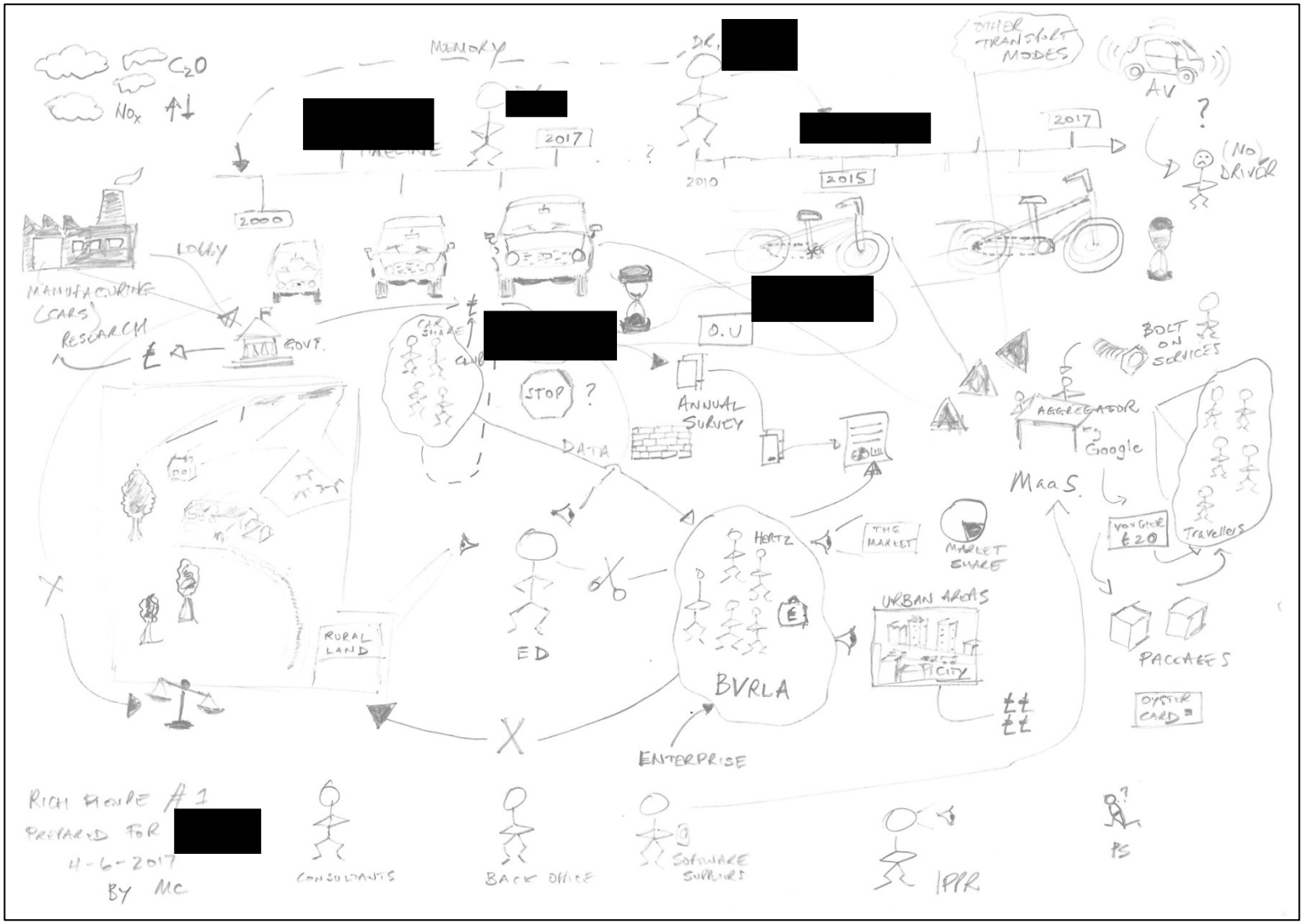


Figure 4-3 Rich Picture for GMC

The rich picture shows a number of concerns and issues. It was created after the initial discussion with the client together with a review of some recent documents – mainly emails – that I had been given access to. There is the public health perspective, depicted in the top left-hand corner of Figure 4-3. The government is concerned about emissions, both CO_2 and NO_x. Local cities – whether through elected councillors or mayors – are desperate to improve air quality measures to meet targets set by central government or by world bodies. Fewer car journeys can mean improved air quality, as can other transport modes advocated by the charity, for example cycling and ride-sharing. Relationships with car producers are tenuous, and the general view is that the car makers spend time lobbying government and the EU for favourable market conditions. It was reported that there is some mild tension between the charity and the BVRLA, but this is hardly surprising given their different objectives. The former puts environmental issues at the top of its agenda and the latter is a trade body acting on behalf of its commercial members.

The Initial discussions were broad ranging and informative. I was given an account of all the changes that were taking place. The fast growing bike-share sector, the somewhat mature and “mainstreamed” car sharing sector, the revolution in bike lock devices which made “dock-less” bike sharing possible, the concept of mobility as a service (MaaS) where packages of travel (train, bus, car-share, bike-share) would be bundled together and sold as a service, and the future of autonomous vehicles.

So, what would be left of the organisation if it gave up its work on car club surveys, advocacy of car sharing, and accreditation of car sharing schemes? Some of the ideas about the organisation’s future purpose had been discussed by the CEO and his deputy (the client). Both had taken soundings from organisations and partners that they were close to. GMC was part of a trusted network with other organisations that shared similar interests. It could therefore discuss its future openly, collaboratively. The ideas circulating were as follows:

- GMC as regulator (accreditation schemes)
- GMC as advocate
- GMC as coordinator
- GMC as consultant

- GMC as service provider

These purposes were explained as possible futures, one or more of them might become dominant in the pursuit of the advancement of the charity's defined purpose. The client recognised that each future was "conceptual", a little vague and lacking precision. We agreed that I should build some quick models to illustrate "how a systems thinker might see this".

Two relevant systems models were created based on the first two purposes listed above. It was felt the other purposes lacked differentiation from the first two, and that *consultancy* would likely to continue in some form, regardless of the core purpose. These models are discussed further below together with the reaction from the client.

At this stage in the proceedings, it was not entirely clear how the intervention would be "mounted" to use Checkland & Scholes' (1990) phrase. It was unclear who would be involved in the study, the timings, formal expectations etc. The client did not want other members of the organisation involved at this stage. She was curious about what a systems perspective could achieve but had insufficient confidence to set up a broader study at this time. She was concerned that it would take up too much time for the Board of Trustees. The Board and executive management team meet infrequently, and the trustees have other professional interests. Making the most of their time was essential. I therefore assumed that this would be more akin to a "mode 2" application of systemic PSM where the "stream of ideas and concerns" is interpreted using systems ideas and tools (Checkland & Poulter, 2006). The ideas were therefore used informally. SSM was chosen because the idea of the charity's overall purpose was at stake, and SSM is perhaps the best systems methodology and set of tools for exploring the notion of *purpose* as was argued in Appendix C. I used a mix of ideas from the methodology, using modelling techniques that have been developed by Checkland & Scholes (1990), Checkland & Poulter, (2006), Wilson (2001) and Wilson & Van Haperen (2015). The two conceptual models paired with relevant root definitions would help to structure a discussion on what activities the charity would be required to do to fulfil each imagined purpose. These could then be compared to the organisation as-is, and to other aspects of the sector to create a debate about feasibility and desirability. The

logic was explained to the client, but there would be minimal participation and the treatment of worldviews would be based around the client's perceptions of how other parties thought about the charity's future.

The first notional system was a system to provide targeted advocacy of selected mobility lifestyles (see Table 4-1) and the second sees GMC as a soft regulator and certifier of shared mobility schemes. The root definitions and CATWOE analyses were formulated in conversation with the client and with reference to some documentation that discussed these embryonic ideas. Models were hand drawn by me. Later, details were entered into MooD software, and for the purposes of illustration here, they were created using Pletica software.

	A GMC owned system to provide targeted advocacy of selected mobility lifestyles by mobilising a coalition of experts which work with and influence key players in the mobility sector in order to bring about, or into existence, socially beneficial and environmentally sustainable mobility life-styles, subject to existing and emerging technologies, adequate resources and general willingness of selected partners.
C	Undefined, implicit "Society"
A	Coalition of experts and GMC staff
T	Mobility lifestyles (not advocated) ⇨ those lifestyles advocated
W	Advocacy of selected lifestyles will bring about their existence
O	GMC Board
E	Technology, finance, adequate resources (staff), willingness of external "expert" partners

Table 4-1 RD for advocacy

The model comprises four sub-systems. It envisaged a "coalition of experts" which would pass judgement on specified "mobility lifestyles" determining which were desirable, socially and environmentally. GMC would then advocate the desirable schemes, seeking to influence "key players", be they commercial operators or government policy makers. The resulting model is highly

conceptual, but potentially useful in helping to ask relevant questions of the existing situation.

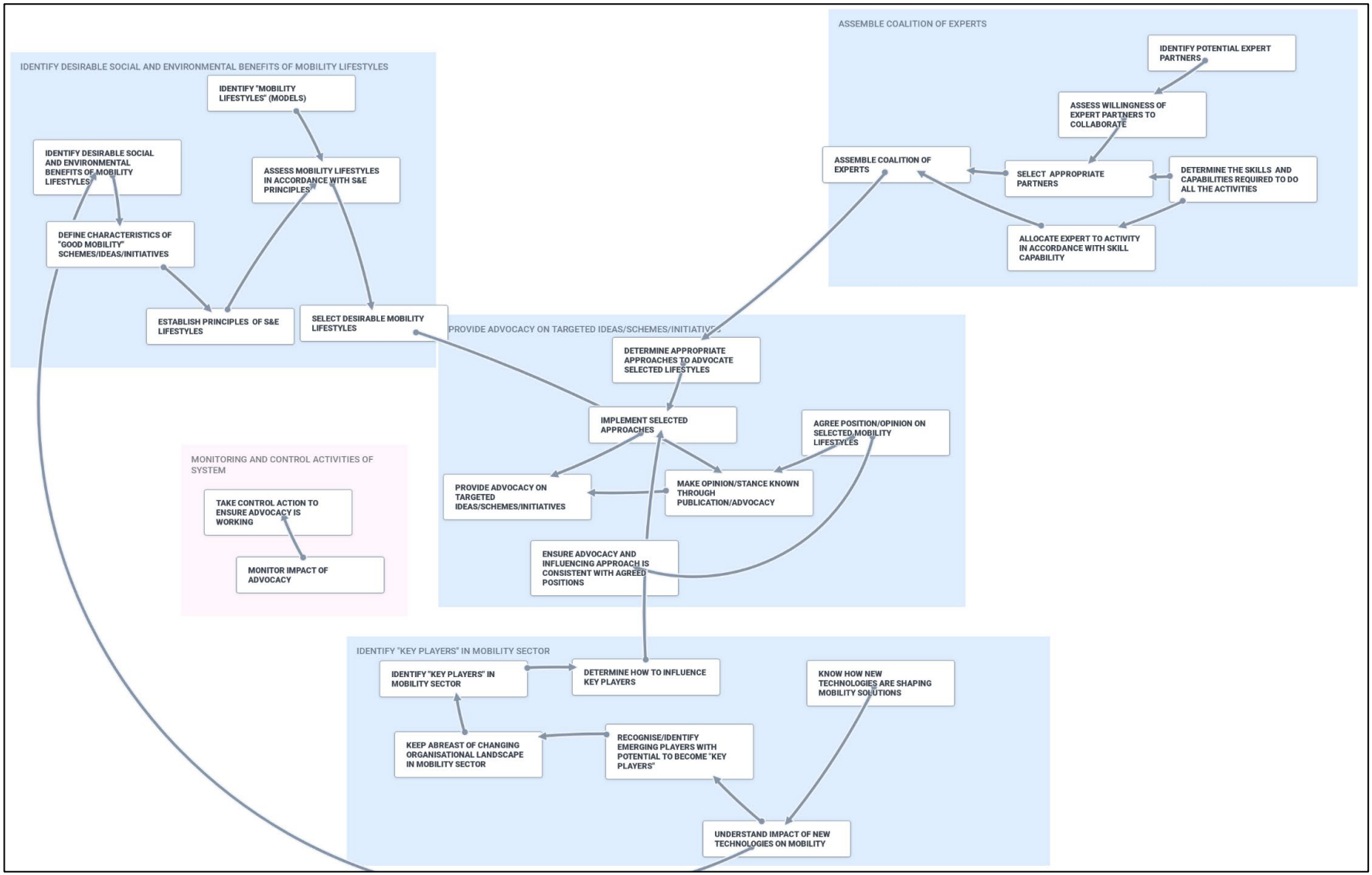


Figure 4-4 An advocacy model for GMC

The second systems definition thought to be appropriate for thinking about the future was to imagine GMC in a beefed-up regulatory role; a much more ambitious notion (in terms of resources) and one that seeks to establish desirable minimum standards for all schemes, whilst at the same time being an advocate of new schemes. It illustrates some of the inevitable conflicts in soft regulation.

Figure 4-5 (see below) A system run by GMC to provide soft regulation and certification of *all* UK-based shared mobility schemes by using a body of knowledge (BOK) about transport schemes to appraise and rank existing and new schemes in accordance with the wishes of operators, would-be-operators and with the backing and recognition of relevant transport authorities and other stakeholders

C Operators, potential operators, authorities with legal powers

A GMC employees

T Unregulated schemes ⇨ regulated, certified schemes

W That designed schemes that have been certified are better… etc.

O GMC Board

E Subject to buy-in from operators and authorities and adequate financial support to run the service.

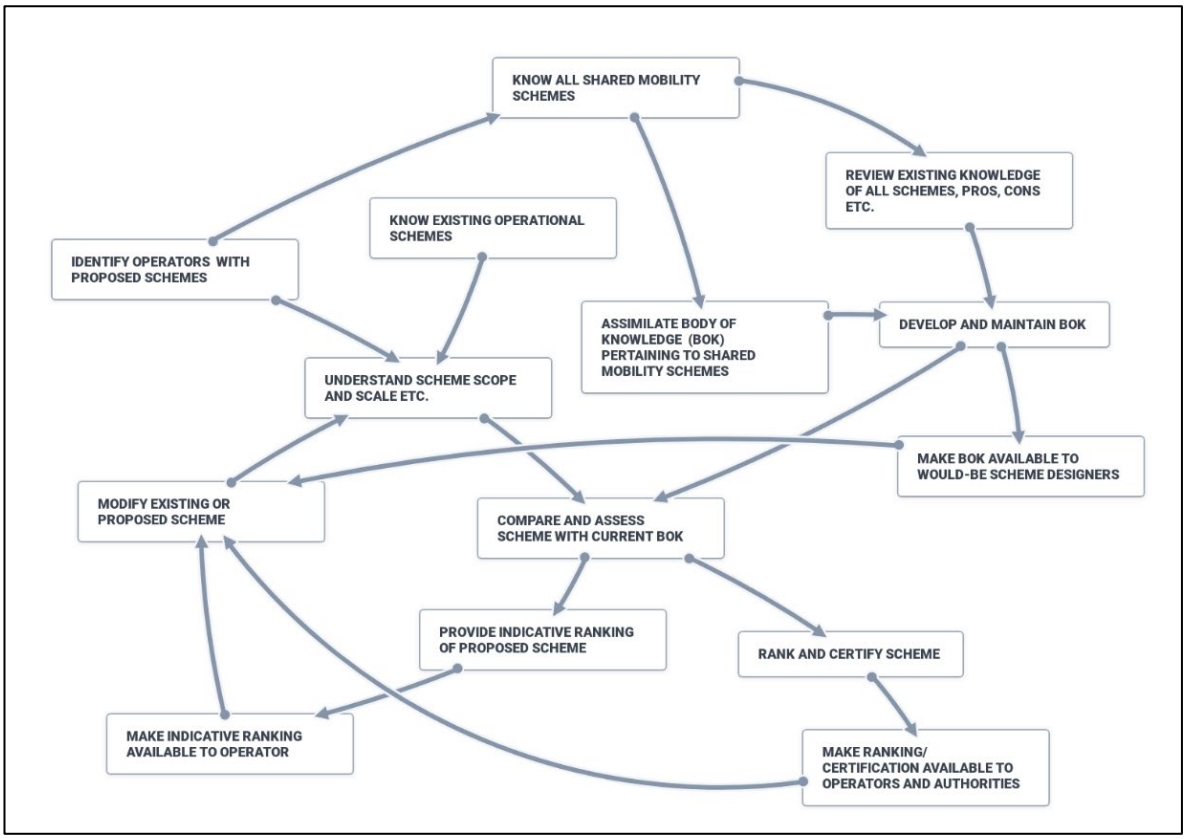


Figure 4-5 A Soft Regulation Concept for GMC

An attempt to compare the first model with the existing situation was made by putting questions to the client but was soon abandoned. A fragment from the table is reproduced below, see Table 4-2. These models were not taken further for two reasons. First, the client felt that such an investigation would be very time consuming. Whilst it might be valuable to document who does what, and how well it is done, the relevance of such information might become dated when the sector was undergoing so much change. That the pace of change was becoming much more salient was evidenced by further documentation that expanded some aspects of the rich picture (see the right-hand side of Figure 4-3). For the client, the effect of technology on shared mobility was making the notion of advocacy difficult to pin down at this time. Advocacy was still relevant, but the range of options was expanding. Soft regulation looked somewhat toothless in light of the disruptive change that was envisaged. For example, Uber had dominated recent talk in the transport sector, and regulators with vastly superior resources to the charity had been playing catch-up. The conversation in the sector had turned to aggregators and mobility-as-a-service (MaaS). Influencing the influencers in this environment seemed a completely different world than nudging Local Authorities to approve new car club parking

bays in the long march to more sustainable car use. How would GMC operate in such an environment? Its considerable knowledge of what works, where and when - predominantly at a scheme or pilot level - would potentially have to work at a much greater level of sophistication, where data about travel behaviour would be less accessible.

Activity	Does it exist now?	How is it done?	Who does it?	Who is responsible?	Does it work? (Efficacy)	Does it work well enough? (Effectiveness)	What resources are needed? (Efficiency)	Improvement?
Assemble Coalition	Temporarily. In Think Tanks and temporary events e.g., breakfast meetings	Conferences Particular campaigns Think tanks etc.	Mixture IPPR Policy Conference Companies		Only takes you so far so not efficacious. It's temporary. Not enough. Just results in "messages"		In some ways	Scope to Improve Trying to create "Agora" a massive Think tank "Panel of Experts"
Determine how to influence key players	Not really, in BB's head!	AA writes an article and is published	AA		Not enough of this is done			

Table 4-2 GMC Comparison Table for Advocacy Model

The main reason for abandoning these lines of enquiry was that the client was becoming less interested in exploring the *content* of the problem situation, and was more concerned with the *process* of how the organisation, and more pointedly the board of trustees, would come to a decision. This type of systems study, which was not explicitly addressed in the literature on SSM until late in its development, became known as SSM(p), which addresses the "intellectual process of carrying out the intervention" (Checkland & Winter, 2006, p.1437). In other words, this would ask what needs to be done and by whom in order to ensure that GMC comes to a decision about its future. This led to a shorter second phase and a new model.

4.3.4.2. Phase 2 – the intellectual process of decision

With the board meeting fast approaching, the client became more concerned about how the board of trustees – a group of responsible, capable, and busy people – would come to make a decision. She was keen to build an agenda, so that the board could make an informed decision. The systems definition for this became:

RD1 A system operated and owned by the CEO and Deputy CEO of GMC to provide a robust consensus on the future of the car sharing operations of GMC by orchestrating an informative and decisive discussion by the GMC board, which determines the future of its car-sharing operations, and by implication, provides mid-to-long term direction for the charity, to the satisfaction of the board and operating within the normal constraints of time and discussion available in a typical GMC board meeting.

C The GMC Board and the Executive Directors

A The Board facilitated by CEO and Deputy CEO

T Future of car sharing operations "up in the air" ⇨ consensus on future of car sharing operations

W That car sharing operations has reached a degree of maturity that calls for a review and a decision about its future.

O The Board, ED and D

E Subject to the wishes of the Board, the agenda and time limitations

The resulting model is shown in Figure 4-6:

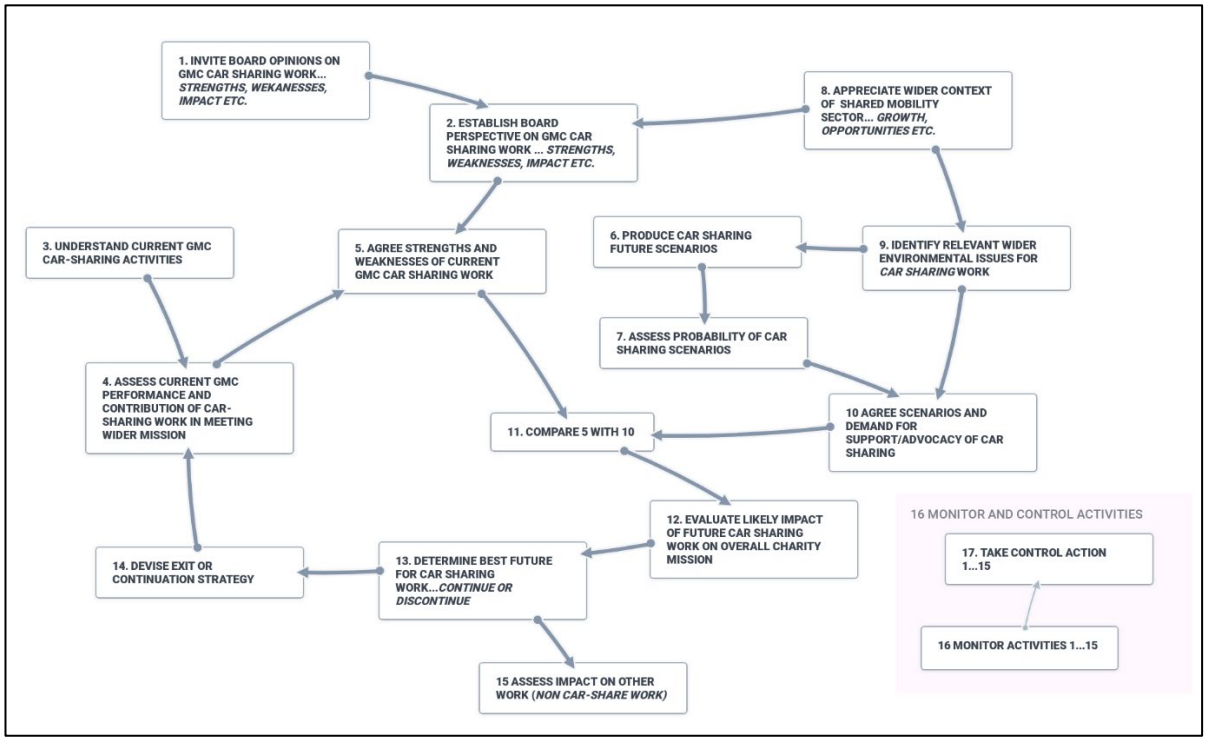


Figure 4-6 GMC SSM(p) model - process of decision

A systems model describing how to arrive at a decision, having followed a thorough process may seem unnecessarily complicated and introspective. It throws doubt on the effectiveness of already existing governance arrangements, or on the client's self-belief in orchestrating and supporting such arrangements. On the other hand, it indicates the worldview of the individual client and her concern, at this moment in time, whether GMC is well placed, (does it have sufficient information, has it been apprised of relevant facts etc.?) to determine an important strategic decision. An intervention that was assumed to be about the *content* of the problem situation had quickly turned in on itself to express concerns about the perceived problem of preparedness, readiness, and decisiveness of the Board. This is not without precedent, as Checkland & Winter (2006) have pointed out. It also demonstrates that systemic PSM does not *necessarily* have to include extensive participation, but can be used as a tool to clarify one's own thinking. There are times when managers and would-be decision makers step back from the situation they are trying to manage and give

due consideration to how the intellectual process of enquiry should be carried out, and who should be involved. For example, reflection of this kind helps to develop terms of reference, constitutions, stakeholder meetings etc. Conceptualising thoughts in one or more notional systems may help to clarify matters and emphasises that ongoing monitoring and controlling is a necessary component of the process of intervention (in this case the *process* of decision). BB would later clarify her interest in this aspect of the study:

> “I think it perhaps was in terms of the actual [board] meeting that I was wanting to make sure that the right processes were followed. That the board members were correctly involved, and their different range of opinions were heard, and they were given the right opportunities. I wanted to make sure we got the most out of them on that day. They're all very smart, intelligent people. But actually, sometimes, when you bring them together in a meeting, you don't always get the best out of people.”

The conceptual model (see Figure 4-6) might well be used to evaluate the activities leading up to and during the actual Board meeting. In this sense the model is a model for evaluation, which is a well-recognised application area for SSM studies (see Checkland & Poulter, 2006, p.83-89.). But it would not be used in this way. The client did not want to “mark” the work of the board in fulfilling its duties, she merely wanted to clarify in her own mind the *processes* that would be required for it to make an informed decision.

This phase was not exclusively about *process*, however, and the investigation switched back to *content* again when the client and I questioned how activities 1 and 8 in Figure 4-6 would actually be met. The client proposed that she wanted to capture trustees' thoughts on the opportunities the charity should take advantage of, so that it continues to meet its wider mission. The purpose of this was to elicit potential opportunities which might be discussed further at the Board meeting. Trustees would be asked to send - in advance of the meeting - three opportunities that GMC might reasonably pursue. These would be compiled by BB and circulated as pre-reading. An agenda item, entitled "3 things", had been set aside for any discussion. The client asked me about the relevance of systems thinking (if any) to capturing and compiling these

contributions. I suggested that the contributions could be captured in a makeshift strategy map. Examples were shown to the client and the logic was explained. Before sending the request, we agreed a question which would be put to Board Members. Respondents were asked to reply using an action verb phrase (in the imperative). The final agreed question was:

> "What do you consider the most realistic opportunities for GMC to pursue in order to be viable in the short-to-medium term?"

The results are shown in Figure 4-7, below.

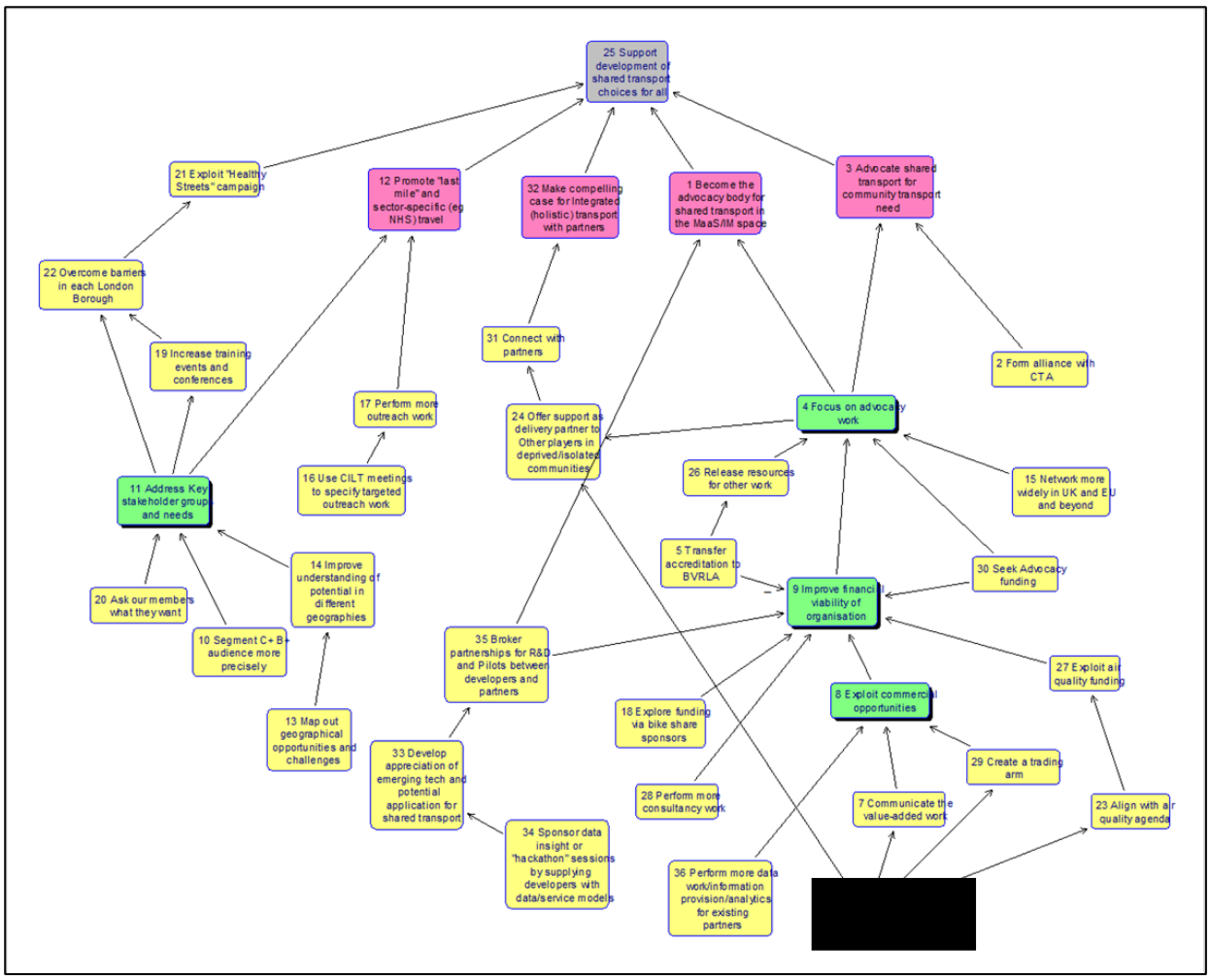


Figure 4-7 "Virtual" Strategy Map for GMC

The purpose - as always with strategy mapping - is to show how important issues for the organisation are linked to others in means-ends relationships. Instead of taking the trustees' contributions one-by-one or performing an overly-simplistic frequency count, the strategy map attempted to show how addressing

one issue might lead to a desired outcome, which in turn might lead to a (higher) desired outcome(s). Using Figure 4-7 as an example, sponsoring a "hackathon" session by allowing a developer to work with GMC data (Concept 34, Figure 4-7) might lead to a better appreciation of how technology and big data can be used (Concept 33). This insight might then be used to broker new partnerships (Concept 35) etc. The emerging map identified high level goals (e.g. shared mobility) which are pursued in different ways by similar organisations in the sector, but more importantly, it would identify lower level goals (see middle of the strategy map) which would distinguish GMC's unique contribution compared to others in the sector, i.e. advocacy, outreach etc. The substantive issue of deciding the future of GMC's car sharing work was now seen in a wider context, but also starkly highlighted the consequences of letting the work go. According to the map it would release resource to do more advocacy work, but also reduce the charity's financial income. The map is under-developed and limited because, as was mentioned above, trustees' time is very scarce. The map had to be created virtually; the links had to be inserted by the author in discussion with the client only; there was no time to discuss, debate and validate the causal logic of the strategy map.

Phase two lasted no more than a couple of days and both of the models created during this stage were about anticipating the forthcoming board meeting. It was a case of "quick and dirty modelling"; thinking and reflecting, rather than mounting a more comprehensive study, the prospects of which seemed unlikely. To my surprise I was invited to the upcoming board meeting, but as an observer only. Again, the issue for my client was time. I would not be permitted to lead a session on anything, there would be insufficient time. For me, it offered the opportunity to see how well the board went about their business compared with some of the evaluative model laid out in Figure 4-6. I imagined that the strategy map created virtually would be discussed and I was interested in how the trustees would see their contributions linked to other's. But it was also a chance to see if further application of systemic PSMs might be required or was thought to be desirable.

4.3.4.3. Phase 3 – The board meeting

Details of the board meeting are available in Appendix K.

4.3.5. Outcomes

This case provides insight into how a small charity goes about making an important decision about its future and how it presents this decision to its governing body. It shows an attempt to weave systemic PSM into other more routine practices, how it might be used to clarify individual thinking, and some of the difficulties in that mingled weave. Did the intervention help to address the client's problem - the feeling of unease about the organisation's future?

It was a modest intervention, driven by the client's tight remit. As reported above, the client claimed to have got something out of the thinking and modelling that was performed in the lead up to key meetings. The client recalled:

> "It was a really critical time for the organisation, and it was really useful to help to steer, and find a solution. Because it felt like there was lots of barriers and blocks and it helped to kind of move us towards it. And it took quite a long time to move us towards the answer."

It is impossible to gauge how the systems models and discussions influenced later events, but there was some appreciation from the client. She thought the "*process*" was important and saw our meetings as thinking "*exercises*":

> "My overriding memory of that time was how the usefulness of the process of doing them [the models]. By forcing myself to go through the exercise of looking at the different routes and different options, it triggered ideas in my mind. It triggered different analyses of thoughts that I then took to meetings to discuss. So, I found that [the process] was more useful than the outputs. I guess I did probably refer back to the output. So, I'm not saying that that was not useful as well, but I was struck by the fact that the thing I found most useful is the fact that it was a tool to trigger my own thought processes."

There were positive remarks too about the role of rich pictures. She found these “memorable” and understood their relevance to this particular problem context.

> “We were pulling apart what the organization does and the basic building blocks of it. I think it fitted where we were at.”

She appreciated the logic of the strategy map. It helped to pull together what she considered to be “disparate” contributions from the trustees into a logical order, though she conceded that it needed more time for it to be truly understood and effective.

Despite these favourable outcomes, there were elements of the intervention that were less successful. The comparison tables – supporting the SSM models – were “laborious”. At most, we probably spent 15 minutes on this part of the process before I recognised the client’s impatience. It was also clear that some of the time spent modelling could have been accelerated to focus on more pertinent elements:

> So, I think the danger with these processes is, a lot of it is kind of stating the obvious. If you've got a group of people in the room, they will all go with their gut reaction. They've got reactions which are fed by the fact that in their brain they've done some informal kind of plotting of all of those things [in a model], but they might miss one or two. I think that's the key thing. So, I found some of it really laborious and over the top and I'm sometimes impatient, a time-strapped person, you know? So, it was kind of difficult. But I do get the fact that actually by going through 80% that you knew already in your head, it then forces you to get the 20% that you haven't thought about, you know? I think it helps to give legitimacy and credence to your discussions if it's all been mapped out rather than just those gut reactions.”

So, in several respects the client, BB, might be reasonably considered a reluctant adopter of systemic PSM, with some strong recommendations as to how the process of intervention could be improved. But there are many barriers. And in this case study some of the most prevalent barriers were related to

existing problem-solving preferences and the client's attitude towards time and action.

4.3.5.1. Complementing extant PSA?

The problem situation was to decide GMCs future, to make sure it remained relevant in a fast-changing sector. The case study was a window into GMC's problem-solving approach and culture, one that comprises of pooling the deep knowledge of the directors on shared mobility and combining this with wide ranging consultation. GMC's directors have an open, flexible, and trusting way of working with others collaboratively. This was evident through the CEO's ability to go out to other organisations in the sector, some of whom, like the BVRLA, might easily be described as "competitors". The sector was sufficiently transparent and open enough for the CEO to ask these organisations for their "views on advocacy for car clubs" and even opinions they might have "about the future development of GMC". Further evidence of this openness is apparent in GMC permitting me to write a case study and allowing me to observe its board meeting. BB emphasised this collaborative and open practise:

> "It's the nature of the organisation, we represent a sector, we always are collaboratively looking for input."

GMC coordinates this input through talk and discussion. Opportunities and challenges arise and the main tool for deciding what to do is meetings and discussion through various fora. In many ways GMC is continuously devising strategy in relation to events. There are different ways of discussing strategy. BB talks of how some meetings can be a "blank canvas" and how others might run along the lines of: "these are the solutions, what do you think?" It all depends on the context. The pressure of time and cultural factors appear to be major determinants of the meeting design, whether the agenda is fluid, or more structured and agreed in advance. Cultural factors determine whether there are any "experimental" or unconventional methods used to support or stimulate discussion. Convention in this sense is getting participants' "gut feelings"; their "gut reactions" to the topics at hand. Could the client see any use for the tools that we had used during the intervention, and would she be willing to give them a try? There is hesitation in BB's reply:

> “Yeah, … I think when you suggest things, I think, oh, okay, that could be useful. And I might consider it. I've got another similar type of meeting coming up soon, where we are talking about different strategies, but generally, honestly, it wouldn't naturally occur to me, you know. I haven't really thought about using those tools in between. I think there's a sort of etiquette that people tend to use SWOT analysis, and that's the kind of done thing. But, you know, walking into a meeting with a rich picture I think would be quite a brave and different thing to do. I've never seen it done anywhere else.”

BB estimates she can spend at least one third of her time in meetings. These might be virtual meetings or webinars, but often there is considerable travel involved to major UK and European cities. As a means of getting the work done, there is no sense that meetings are beyond criticism, it is more a case that they are an accepted way of practice, and departing from what is custom and practice is not without risk:

> “We're constantly in forums of different people with different discussions, and I'm interested in ways of making them more creative, more productive. I'm open to that completely. But I think that meetings are always limited for time, and so to do something [different], you would need to know it was going to work, or you would have to have high faith in it.”

Conventional meetings then – with or without agendas – are the least-worst option. They are easier to manage too. This does not mean that the deputy CEO disregards their imperfections:

> “It's always very easy to go with your gut feeling. And, actually, many decisions are influenced by lots of people's gut feelings, or whatever they'd last read or they'd last heard or were influenced by somebody who had shouted the loudest… rather than getting to the quieter facts, and these quieter factors being fed into the process.”

There was little time for the client to become familiar with the methods and so her caution about trying them again was understandable. When I asked if there was a risk dimension to using systemic PSM tools she was unequivocal: “Definitely, yes.” Would she have the same problem facilitating a SWOT analysis?

> “No. I mean, it can feel a bit cliched sometimes doing that, but I think that's exactly the kind of thing that people are traditionally used to doing, even if they do it in a bit of a shorthand way. I think it's about my personal confidence of being familiar with how the tools work and what I would do with it. But also feeling that - particularly with a new audience or a different kind of dynamic - that culturally I could get them to accept what I'm proposing.”

The client emphasised that a tool has to feel “natural”; it has to be habitual and could be “applied to a range of situations”. She would not want to go away and “read a textbook for half a day just to remember how to do it.” At the same time, she did not think the methods were the exclusive province of external facilitators and consultants. “Personally, I'd really like to have more familiarity with one or two tools.”

It was challenging to see how systemic PSM could be woven into the fabric of everyday practice at GMC. Its appetite for orthodox meetings and for talk would continue:

> “Would it be useful, would I get more out of a meeting if I go in and encourage people to do an exercise? Or would I get more out of it if we just go through the typical, right, ‘here's the agenda’ and get everybody's gut feelings. I think the other consideration is cultural. The fact that there is a traditional way in which you do these kinds of meetings and - particularly if you're not really familiar with the people - it's quite hard to be innovative and hold people with you. You could see some eyebrows being raised as to why on earth are we doing this [a group process using systems methods]?”

But this of course does not exclude the possibility of using systemic PSM to produce insights which can then be reported in conventional meetings and using it to complete actions that were agreed as a result of meetings.

4.3.5.2. A stitch in Time – action orientation and pragmatism

As reported above BB is a time-strapped individual. Time pressure was mentioned as a factor in many of her answers to the questions that reviewed the intervention. More importantly, she perceived the tools and methods that were used to be time-hungry. Was it worth the effort to employ systems tools when, in the client's estimate, 80% of the required content could be captured using orthodox means? There was a possible bias towards the notion of a "single right answer" too, because the client was searching for some form of guarantee that the 20% "revelatory" content could be delivered too. Curiosity and speculation have their limits.

A more comprehensive systems study exploring different perspectives was not something that the client would seriously consider. The perceived urgency of the issue counted against it. Another factor was the client's self-awareness of her strong action-orientation which seemed at odds with her perceptions of systemic PSM and other participative processes as reflective enterprises which suit some more than others:

> "I know it really depends on who you've got around the table with you. Some people will be really open and receptive to that reflective process and other people are much more interested in 'let's just skip to the solutions!' Personally, I'm an action-oriented person, so I know I find it harder. But I think because I'm aware of that, I've seen the fact that it's useful. And even if it's not - this sounds a bit arrogant – even if it's not necessarily useful for me, I can see it's useful in terms of the process to get everybody's consent."

This image of a reflective, deliberative, time consuming but necessary *process* of inquiry contrasts with the declared intent of systemic PSM which is to *structure* problems, quickly and effectively, so that action can be decided.

Again, it was ostensibly because of time pressure, that BB was supportive of using a version of strategy mapping as a means of linking the contributions of trustees in what resulted as a “virtual” strategy map. For the board meeting, this was billed (see above) as the “three things” agenda item. In the end there was insufficient time to go through the map so that participants could fully understand its logic. It would require 2 to 3 hours or so to be of any benefit. This was far too much time than was reasonable given the importance of other agenda items. Even so, it illustrates the importance that BB gives to *preparing* the trustees for the board meeting. They are busy people, but the aim was to:

> “save some of the time in order to trigger them [the trustees] into thinking about the kind of issues that we'd be wanting them to think about.”

Preparing people was important, but not just because of time pressures. It was a question of relevance too:

> BB: “I think this goes back to the fundamentals of a charity like ours and how it relates to its board of trustees. You know, the trustees aren't living and breathing the issues every day. They have their own perspective, which is really valuable. But there's always a different dynamic about the fact of trying to get to a point that fits with what staff feel. I suppose it's a bit like you don't want to completely lead the board to say we really need you to do it this way. You want input, but you don't actually want to get too diverted into things that are really not that relevant, and that inevitably could come up because those people aren't close enough to the detail. It's a tricky one really because they're volunteers, they're never going to be completely up to date with what we're doing.”

This would explain BB’s interest in the SSM(p) model which questioned the proficiency of the intellectual processes leading up to the decision. But it also provides an indication of the client’s appetite for problem-solving approaches that sweep in multiple processes. BB welcomes the input, but demands that it be timely, relevant, and effective. There was little evidence to suggest that a

deeper understanding of some of the tools and their methodological and theoretical roots was of much interest to the client, beyond their pragmatic potential:

> I'm not sure whether it was the drawing where this action leads to this action, which is needed for you to achieve your objectives. Or whether it was the process of doing that or just actually spending time thinking in a different environment. You know, if I'm honest, I don't know which of those methods was the actual thing that led to the creativity. But, in a way, it doesn't really matter if you're going through an exercise which is stimulating new thoughts.

This pragmatism went hand-in-hand with a strong action-orientation that this client showed.

4.3.6. Summary

This case study exhibits plenty of potential barriers to the wider adoption of systemic PSM. Whether fairly or unfairly, systemic PSM was perceived as something that was time consuming. It was perceived as a *process* rather than as a means to *structure* something quickly and take action. It covered content issues of problem situations that were widely known and taken for granted by those familiar with the situation rather than highlight what was new thinking, what was additive. There are simpler tools available that are culturally more acceptable.

In a postscript to the case, the client recently telephoned me to say that she had been working with some academics who were trying to trace and measure the impact of existing and future plans for shared mobility on carbon saving. As the main presenter and facilitator, she had ended up with the job to summarise all of the contributions. Someone had suggested a causal loop diagram might be suitable. She herself thought a cause-effect model, like the one produced in Figure 4-7, would be more appropriate. With some guidance she created her first model in Decision Explorer software and explained the logic and links to her colleagues and partners. After being initiated to systemic PSM, perhaps some fragile roots were beginning to form.

4.4. “Making Canon Valve great again” – Systemic PSM in a manufacturer

Canon Valve SA (a pseudonym) was established in 1884 when it was known as by another name. The company has witnessed massive change. At its peak and under state ownership it employed more than 4,000 people and was affiliated to local schools specialised in developing skills for casting and metallurgy, as part of a wider communist economic programme. By 1996, however, the state had sold the company and a year later it was listed on the Bucharest stock exchange. In 2014 the workforce was reduced from around 200 employees to 45, and its much-cherished iron foundry was closed. This was the low point. The company has fought for its survival ever since. In late 2017 a new General Manager (GM), JJ, was appointed, with a brief to turnaround and stabilise the business. After 18 months of hard work some stability has been achieved, and a growing order book signals growing confidence in the management team. For the first time the management team could begin to cautiously think about a future. The General Manager adopts a version of President Trump’s election slogan to describe this next phase. He wants to “make Canon Valve great again”. How might systemic PSM be used in this context? Could systems thinking be used to sketch out a viable plan for Canon Valve’s future? Would the management team be pre-disposed to exploring different views of the problem? How would the management team, with no background in systems approaches to management, respond to the use of systems ideas?

4.4.1. The setting

My first face-to-face meeting with JJ took place in January 2019 at the Canon Valve factory (see Figure 4-8). The site is a 30-minute walk from Cluj-Napoca’s historic city centre. Beautifully restored historic buildings, modern hotels, shops, and restaurants soon give way to regimented apartment blocks and then dilapidated industrial sites, as one leaves the city centre. Some of the industrial sites are derelict but there are one or two pockets of new investment. The factory site occupies about 10 acres, just north of the railway line and south of the Nadăs river. The adjoining site is the relatively new [redacted]

[redacted] Here, old Cluj meets new Cluj. I am warmly greeted by JJ. He is dressed in blue overalls because he has been clearing snow with some of his team from the access road (see Figure 4-9). They are expecting deliveries. Later JJ tells me that his mode of dress is an important aspect of his management style. He does not want to be a distant figure; he works hard in fitting in and being approachable.

Figure 4-8 Canon Valve Factory, Cluj-Napoca

Figure 4-9 Canon Valve Factory - with former iron foundry

We talk about expectations in his office. The nature of my research had been discussed over the phone in November 2017 and JJ had provided me with an extensive overview of the company, its history, his appointment as a quality manager and later as GM. Several communications had taken place since our first telephone conversation. Some ideas for systems studies were exchanged, and JJ had sent me various updates and financial reports. A good working understanding had been established. JJ is keen to show me the Canon Valve site, which took up the best part of the afternoon, of the first day.

There are two main halls for operations: a tooling hall and a smaller manufacturing hall. In the tooling hall rows of lathes remain idle, but fresh spoil indicates that some machines are still in use. The smaller hall is more modern and is surprisingly busy. There are several CNC milling machines and at least four are in operation. Hoisting and handling gear shift heavy 300mm diameter valves from sub-process to sub-process. A delivery of unfinished grey iron casting blocks is being inspected in the goods-in area. I am introduced to several supervisors. The head of production and the head of quality are both

female. The finishing area contains a variety of heavy-duty valves of different dimensions ready for shipment to CV Parent, [redacted] Canon Valve's only customer and de facto owner, due to its majority shareholding in, and substantial loans to, the Romanian operation.

I am taken to the ancillary buildings. These too are surprisingly busy, but the activities undertaken here are unrelated to Canon Valve, for the buildings are occupied by the company's tenants. There does not appear to be a shortage of tenants for Canon Valve's surplus buildings because Cluj-Napoca is booming. According to the *Economist* (2018) Cluj is one of only two cities in Romania where the population is growing rather than shrinking. Much of the growth is explained by the expanding IT sector, and one suite of offices is occupied by a software company. Another building has been taken over by an insulation firm and one other is rented by a state authority. The rents help to offset some of the depreciation charges that prevent Canon Valve from reporting a profit. The company would be able to report its first surplus in 18 months were in not for the depreciation charges, something which are beyond the current management's control. The practise of letting the buildings is endorsed by the board and by CV Parent.

The final part of the tour of the factory finds us in the iron foundry. It is a substantial building with a conveyor system stretching to an estimated 40 metres. A giant pouring ladle has been sold off, again with the permission of the board, and a sign that the current status of the foundry as "in conservation", meaning "maintained but not active" or "safeguarded for future use", looks overly optimistic. Later in our conversations JJ is more realistic and acknowledges that the foundry on its existing site "is not coming back". But it is a source of regret. He is animated when talking about the foundry and above all about past management failures in deciding to mothball the facility. The decision was based on false premises according to JJ. The board had supported the decision of the then general manager (JJ's predecessor) to close the foundry, thinking that it would help to reduce energy costs. It did, but not substantially. The decision also meant greater dependency on CV Parent. One of the strategic advantages of the foundry was that it allowed Canon Valve to produce different products for different markets. Later, investigations by the management team revealed that poor infrastructure and poor maintenance

accounted for most of the heat and water losses that were contributing to the excessive energy bills. As soon as the faulty infrastructure was replaced the costs began to fall.

4.4.2. Client, problem solvers, problem owners

The client for this case is the General Manager, JJ, responsible for agreeing to the study taking place and ultimately responsible for when the study comes to an end. He is also the main problem solver with the means to use his and others' knowledge of the problem situation to create improvement. JJ is considered a "young" general manager, aged 39 years. He is very hard-working. I was first introduced to him by a colleague from Babes-Bolyai University (UBB). This colleague had worked with him on matters relating to Human Resources and was impressed by JJ's work-ethic. It is not uncommon for him to be at the factory six days a week. In fact, one of our meetings took place on a Saturday. On one occasion during my visit we worked long into the evening, discussing the company's past and future. Canon Valve had become something of an obsession for JJ.

He was educated at UBB and graduated in public administration from the political science faculty. How did he come to be in charge of an engineering company? "I'm not so used to engineering… but somehow I convert myself and I prefer it". His career in manufacturing began as a line worker for [redacted]. He was later trained in quality management and became quality manager before moving to Canon Valve four years ago, where again he became quality manager. Two years into his tenure at Canon Valve he was asked to take over the GM role. He declined. He did not think it was the right time. After another two years he was asked again. This time he accepted.

JJ has two loyal deputies, KK and LL. KK is his personal assistant and deals with administration, human resources, legal matters and the estate. She is very successful at securing new tenancies which help with income for the site. LL is more senior in age and experience. He is described as a "consultant" or mentor to JJ. He works part-time, was a member of the union when Canon Valve was in its heyday, and his appointment as mentor/consultant was sanctioned by the Board in recognition of JJ's limited experience. He is well respected,

charismatic and a good negotiator. He takes on some supervisory responsibilities when JJ is not around. His main role is to “unify the workforce”, meaning to make the staff more flexible by breaking down demarcation of responsibilities. He trains operators so that they are multi-skilled, so they have a range of attributes and can be assigned to work tasks as the need arises. An organisation chart with a range of skills and attributes, listing who can do what, is his main task. The aim is to get more of the matrix completed. Both LL and KK made their views known at various points during the intervention, but their comments tended to be channelled through JJ whose command of English is better. The potential problem owners are typically many and varied. In this instance they include the workforce, the wider CV Parent management team, the board of directors (comprising CV Parent directors and others) and even municipal planners responsible for economic development in the city. CV Parent’s head office is based in [redacted] There are 35 companies in the CV Parent Industry family, which includes Canon Valve, SA. This extends to 61 organisations through holding companies and they are active in 9 European countries (Dun & Bradsteet, 2019). Some of the wider stakeholders were represented through the board of management, but it was expected that their views on matters would become more relevant after initial scoping of the intervention.

4.4.3. My interest and involvement

My interest in this case came about as a result of earlier conversations with JJ by telephone. Two comments in particular had piqued my interest. First, the client was very serious about keeping Canon Valve alive. He made several comments about jobs and about the importance of these jobs for the operators and their families. There is palpable pride in Canon Valve’s long past and what it could become. This went beyond mere nostalgia; the client believes in the company and its value to the community. It is both a turnaround story therefore, and a story about how to manage companies in declining or traditional industries. The closure of Canon Valve would have negative implications for certain sections of the community. In some senses this brought the case much closer to a type of Community OR. The second comment was about past management failures. JJ is very dismissive of previous attempts to manage Canon Valve’s fortunes. He calls this a “communist type management… a

communist mentality". This opened up the possibility of exploring new ways and purposes for managing Canon Valve, and to compare these directly with previous attempts to run the company and to compare them to CV Parent's views on how the operation should best be run. There were good reasons to think that systems ideas would be relevant to Canon Valve at this time. The management team wanted to broaden its outlook. The focus on survival would continue, but for the first time the new management team could think about the future.

4.4.4. The intervention

The intervention took place in two phases: three days in the first phase (January 2019) and two days in the second phase (April 2019). The first phase comprised finding out about the organisation and discussions with the management team. SSM was the main approach used, together with a SODA causal map. The second phase employed the Strategic Choice approach to examine inter-connected decision areas.

4.4.4.1. The soft systems thinking phase

After the first day's discussions and a review of the rich picture see Figure 4-10 it was thought prudent to continue the "finding out" by using SSM further to create some sharper questions about the problem situation.

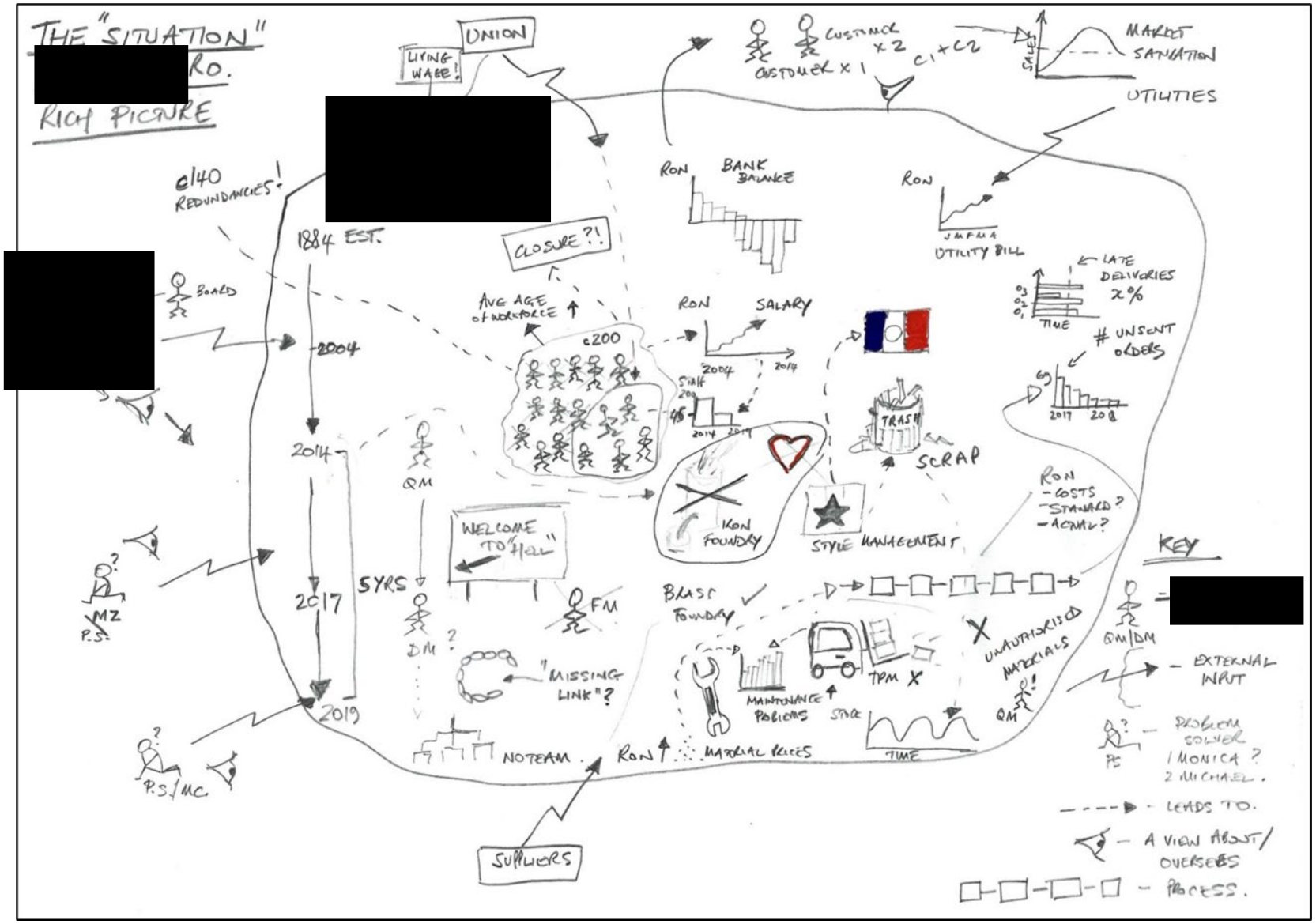


Figure 4-10 Rich Picture for Canon Valve

The rich picture had been created in the spirit of “this is how I am seeing your situation”. It was well received by JJ and was thought to capture the last 18 months of his time as general manager (see Figure 4-10).

Two conceptual models were created as a means of generating further questions, to compare necessary logical activities derived from a pure concept with the perceived situation. This seemed a natural extension of the “finding out” that had taken place on the first day. It made sense for me to produce the initial conceptual models and for JJ to discuss them with his management team (in Romanian) before meeting me to go through the models in more detail. For this reason, I took the model building “offline”, away from our discussions. The models were produced by hand and later using Plectica (2019) software (see Figure 4-11 and Figure 4-12 below). JJ was interested in an investment model, and I chose to supplement this with a “primary task” type model so that some of the initial ‘finding out’ could be validated. The two models would also help the management team to make a choice about further investigations. The root definitions were as follows:

> RD1: An Canon Valve owned and operated system to supply high quality valves to a single customer, CV Parent, by managing a single site, multi-building facility, subject to meeting satisfactory returns for CV Parent, and in accordance with Canon Valve ambitions.
>
> RD2: A system owned by the GM of Canon Valve, operated by the Canon Valve management team which produces a realistic investment plan for consideration by CV Parent, as customer and likely investor, subject to agreement by shareholders and consistent with the Canon Valve team’s vision.

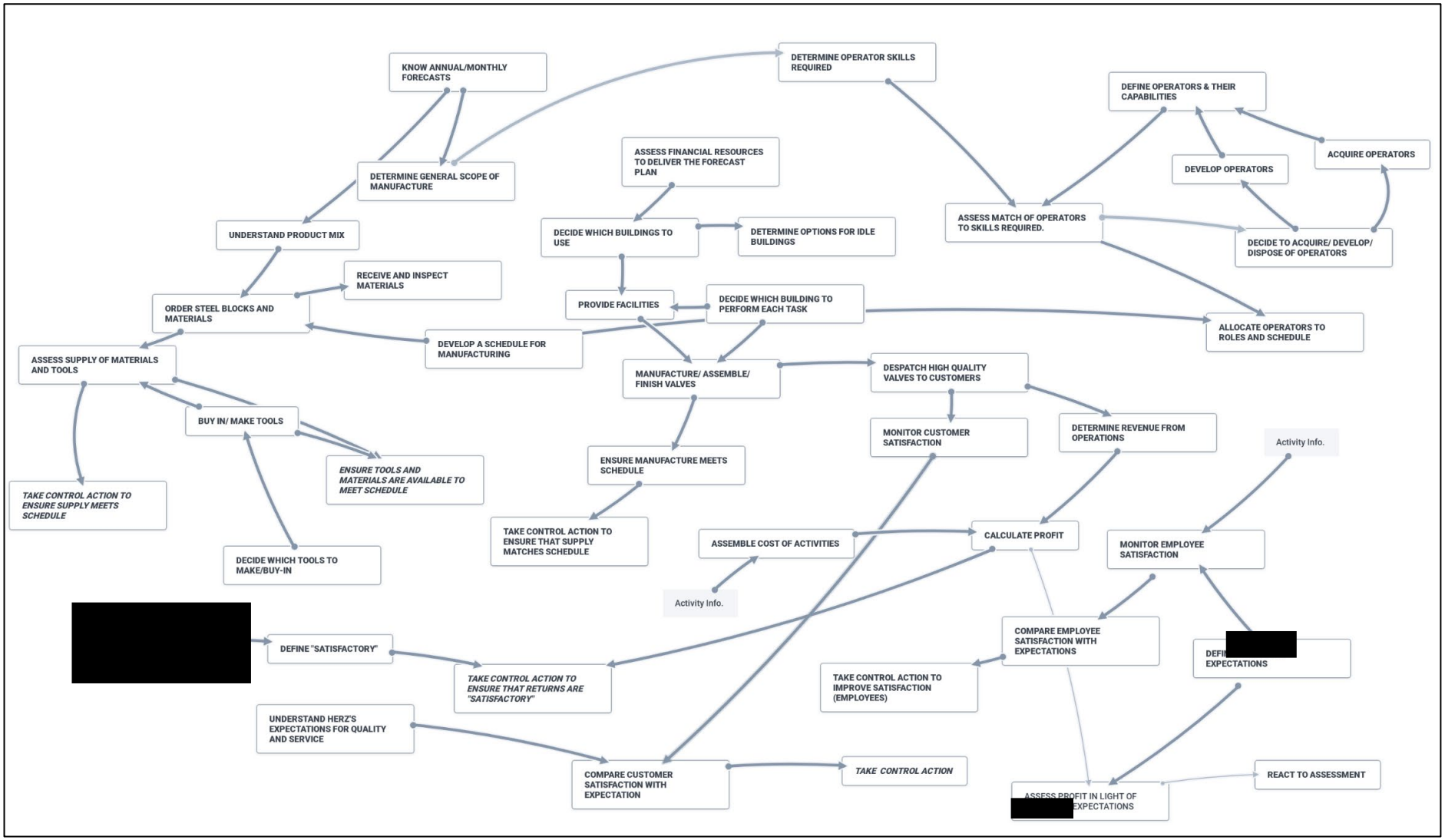


Figure 4-11 Canon Valve Primary Task Model (RD1)

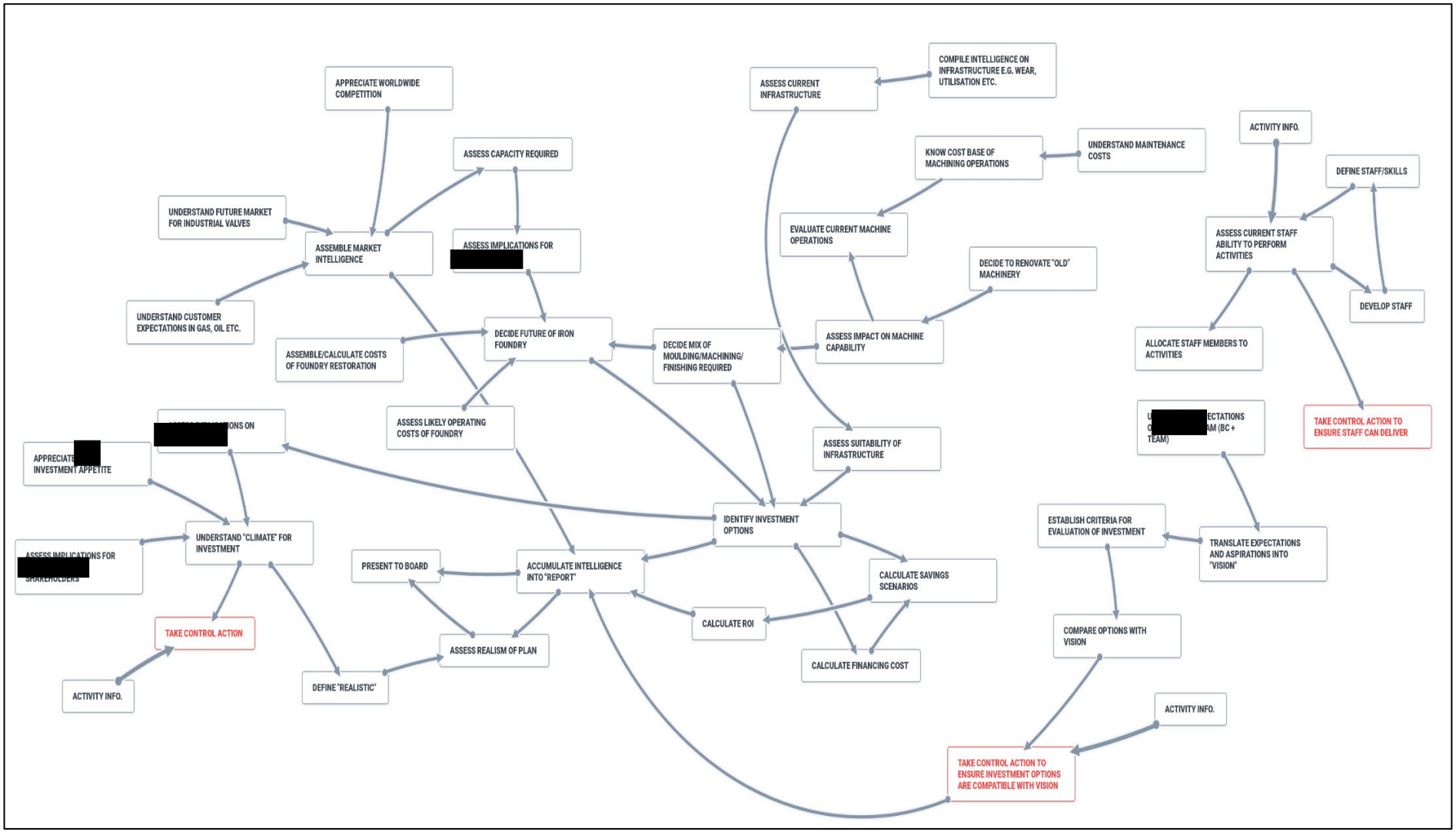


Figure 4-12 Canon Valve Investment Model (RD2)

There was less interest in the primary task model. JJ felt that he and his management team had a “clear vision of what is happening now and a small ‘preview’ of what can happen with Canon Valve” in the future. It was thought to be more valuable to explore the investment model in more detail. The early modelling had produced some expectations about the intervention. The client said:

> “It will be so perfect if after we close the discussions in April or maybe in the summer, the discussion about this, the way of thinking using systems, if only one great thing will emerge from this, I would be able to apply it and say, wow, I never thought that something like this can be applied to Canon Valve…and has an impact on operators, on activity, on financials, on statistics, it will be perfect. But I think it is going to be more than one thing.

Debating the investment model in the management team had some immediate benefits. It provoked interesting conversations and moments of reflection. Much of my discussion with JJ revolved around two activities in the model:

- Appreciate CV Parent's investment appetite
- Assemble market intelligence

In many respects the comparison table, which can be completed as participants discuss the activities in a model, can be tedious. It appears to work best when the more relevant activities are singled out and the rest can be discarded save for their role in making the systems concept obey the underlying logic. It also helps to be persistent with questions about those activities deemed most relevant to help participants in their thinking.

> “I've got to ask it because it's in the model. You know, at some point you have to appreciate CV Parent's investment appetite, their appetite, because it's about timing. How do you do that?”

The logic was that understanding the climate for investment would allow Canon Valve to define a “realistic” plan that they could present to the board based on the understanding they have about CV Parent’s attitude for investment. JJ was

evasive, and was waiting for this moment to arrive, rather than plan for it and tended to talk about a vague notion of “destiny”.

> “I don't know when the timing is right, but I know that I can create some particular things in order to go for the [right] timing. These particular things are related as I said: no late deliveries, low costs, average age of operators low etc. and when I have all these each will be like a single flower, yes? Forming a bouquet yes?”.

I asked:

> “I would want to make sure that my house is in order too, but that's not my question. My question is, how do you know that would help their investment appetite? Having confidence in you is fine, but that's a slightly different answer to the question. The question is, when are they looking to expand? When are they looking to send you more orders for higher volumes of valves? Is there something that we could potentially change in your organization so that you can detect their intentions, perhaps access to market reports from CV Parent, or more market intelligence?”

JJ’s reply: “It is possible. But regarding timing, you know, maybe I'm a bit fatalist”. I persisted with a line of questioning, sticking to the logic of the model. JJ acknowledged later:

> “I kind of evade your question, yeah. I told you that I need to prepare some details to have strong points in [my] hand when I start the discussion [with CV Parent]. But you told me that these are not creating the timing, they are just helping a bit. The timing, this kind of gives me something to think about. I stopped thinking about how to improve it and what to do [to influence events].”

In phase 2 of the intervention, JJ made this point again: “part of your information [in model RD2], which I managed to obtain …. by direct discussion, I kind of

managed to, not to implement, but I kind of managed to change my perspective about Canon Valve using these ideas." These are tiny gains, in this case JJ's understanding. But they say something about using the models with precision and being persistent with the questioning. All too easily, participants may gloss over the details. A capacity to show, briefly, a synoptic view and then to move quickly to a focus on some highly relevant activities seems necessary.

In addition to the two systems models a causal map was developed to capture some of the strategies and actions that were currently helping to reduce costs and boost confidence in the operation. These are the "small details" which are so "important" for JJ, LL and KK. The purpose of the causal map was to spur the team into thinking of further activities that could strengthen the causal logic with the ultimate outcome of improving confidence in the Romanian operation.

4.4.4.2. The strategic choice phase

To continue the investment theme, I proposed that we begin to look at some of the strategic options facing Canon Valve and I introduced KK to the strategic choice approach (SCA), demonstrating how it might be useful to examine decisions that were related to one another. What were the key decisions? What were the options for each decision? Were these compatible? Could a finite number of scenarios be identified, compared, and then taken to various stakeholders for comment? Would this help to progress the matter?

Some initial generic ideas were set down to help the management team understand the logic of the PSM.

DECISION AREA	**LABEL**
What site(s) to operate from?	SITES?
Whether or not to resume iron foundry operations?	FOUNDRY?
Whether to restore 2 old machines?	MACHINES?
What assets (equipment) might be sold to generate cash?	ASSET SELL?
Whether to increase or contract the number of tenancies at the Garii site?	TENANTS?
Whether or not to upgrade the infrastructure at the Garii site?	INFRASTRUCTURE?

Whether or not to upgrade the buildings at the Garii site?	BUILDINGS?
What additional training should be undertaken by Canon Valve personnel?	TRAIN?
Whether or not to increase the product range?	PRODUCT?

Table 4-3 Initial set of Decision Areas

This initial set of ideas was pruned to a much more manageable set as shown in Figure 4-13 which represents a hand-drawn diagram from one of the meetings.

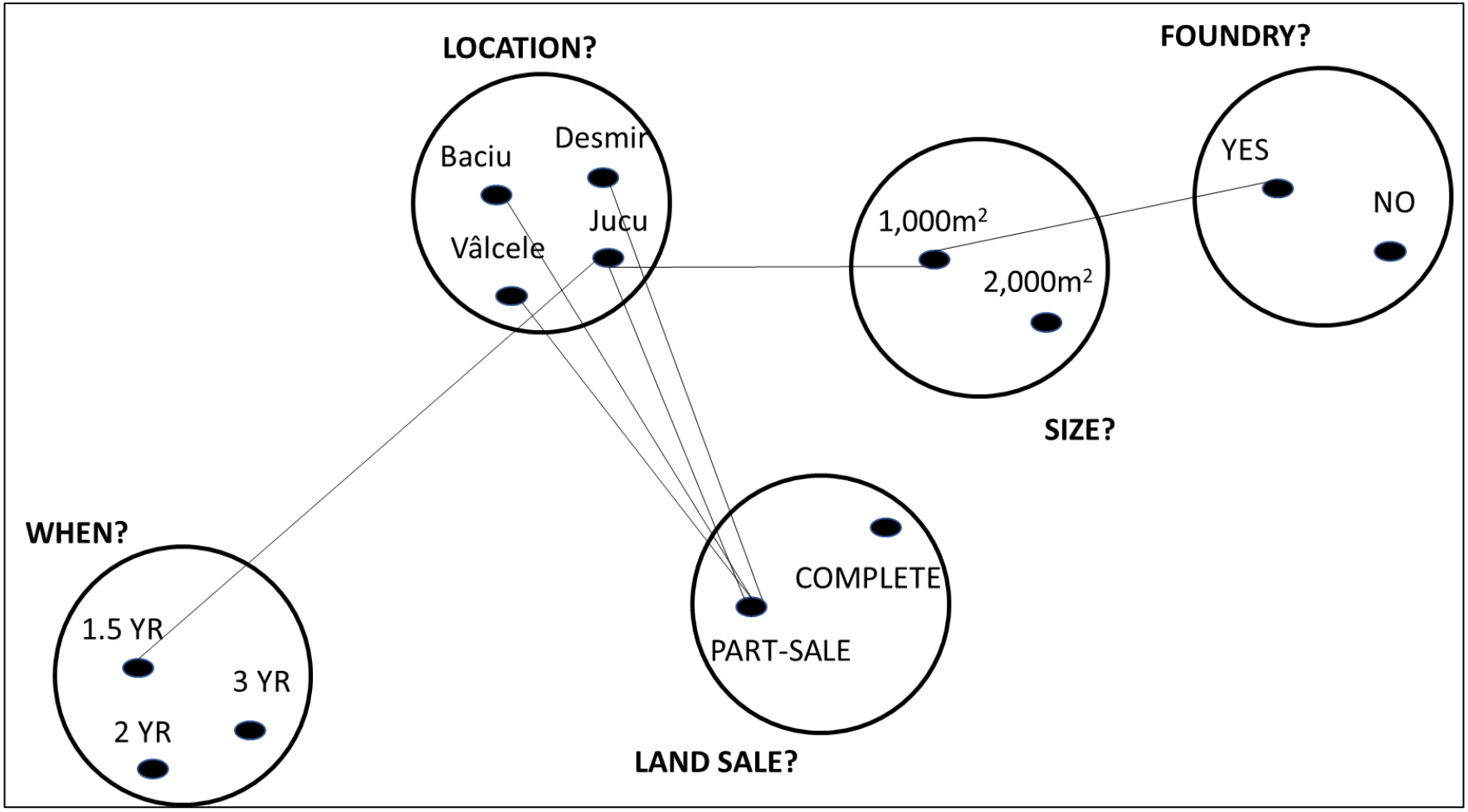


Figure 4-13 Option Bars, following discussion

The options were further simplified in Table 4-3 and Table 4-4 below and indicate 8 main options with multiple timeframes (23 schemes in total).

OPTION	Land Sale	Size of Site	Location	Foundry	1.5 Yrs	2 Yrs	3 Yrs
1	Part Sale	Remainder	Existing	N			
2	Complete Land Sale	2000m^2	Baciu	Y			
3		2000m^2	Desmir	Y			
4		2000m^2	Vâlcele	Y			
5		2000m^2	Jucu	Y	X		
6		1000m^2	Baciu	N			
7		1000m^2	Desmir	N			
8		1000m^2	Vâlcele	N			

Table 4-4 Eight main schemes with multiple timeframes

General comparison criteria were discussed and defined as follows:

Criterion	Explanation and Implications
Cost of site (m^2)	“Probably” the most important criteria. But land is inexpensive in the Cluj-Napoca hinterland.
Operating Efficiency	Access to the site would be important
Operator acceptability	Some operators were pragmatic, some would retire if asked to travel out of the city, but a contingency plan to have some form of transport is possible. Jucu is the least preferred option because it is 32 km away from the current site.
Finance implications	The complete sale of the current site would be used to repay the loan to CV Parent. A partial sale would be unlikely to leave much for investment after repayment of the loan.
Canon Valve Identity	The size of the site would determine whether a foundry could be re-opened at a later date. It was perceived that the foundry is important to the heritage and identity of Canon Valve. Tenants too would be a consideration.

The larger sized sites (excluding Jucu which was considered too distant) would be more in keeping with Canon Valve management's aspirations for the future and would help to maintain the heritage of the company. The larger sites would keep options open – specifically the re-opening of the foundry. The iron foundry has a totemic status for the Canon Valve management team. It was, according to JJ, the last malleable iron foundry in Romania. But JJ and LL were both aware of its problems (energy, environmental, safety etc.) and were grateful to not have to manage these problems while they were stabilising the company. In any case, CV Parent has limited demand for malleable products and can find what it needs from markets in Turkey and China. But for Canon Valve's engineers machining is one thing, casting is another. Both these facilities were believed to be important to maintain the heritage. It was not purely about heritage however. The energy giant, EoN, are in the market for the type of product the foundry can produce. JJ states: "..the market is not saturated, only partially with the products from China, but these are low quality, and that's a big advantage in reopening the foundry." It would give the company some independence from CV Parent. The acceptability of the new site for tenants was a minor consideration but had assumed greater significance over the last 18 months. KK had managed to create some "symbiotic" relationships. There was even some informal bartering taking place. One tenant had provided some help with assembly in exchange for some machining. If selected tenants could be offered good terms at a new location, the relationship could continue and some of the costs of looking after a site, for example security, could be shared. The management team had thought about many of the issues but had not captured them in the way that the SCA approach does.

Having established some of the key decisions, feasible schemes and suggested comparison criteria, it was suggested to the client that he might use the diagrams (suitably translated) to get input from others which might establish new ideas and perhaps new criteria that his management team had overlooked. His response was cautious: "Initially with KK and PS, and then go forward to see how it pleases others". He was not against consulting all staff but clearly some of his reasoning was based on his understanding of how things get decided:

> “Next Wednesday I will have the discussion with the board of directors, and the CEO, but it would be a general view because they are interested in other things. Not this. This is a long-term, maybe a medium-term thing, not too instant. I do not know, next two months or three months maybe. And all of this [the detail about decisions, evaluation and uncertainty] can be done step-by-step. Even if, for example, we gather all the relevant information, we may see that the best price is for Baciu and, whereas the general opinion of the operators is for Vâlcele, if the Board decide to move it to, I don't know, Jucu we cannot do more, just implement. They'll say do this, and we have to do this.

There was recognition that there may be marginal differences in price and that other criteria may hold sway and he felt better prepared, but a certain fatalism came to the surface again; that Canon Valve had to play the waiting game, that it was - perhaps properly - outside Canon Valve’s control, that somehow the company might get lucky rather than take the initiative.

The next step, from my perspective at least, was to widen the boundaries, to explore other stakeholders’ views. How did they perceive Canon Valve’s future? Would it be possible to find an accommodation of views which would give more guidance to the management team at Canon Valve, and perhaps provide some assurance to its workers that their jobs were safe for the time being. KK, for example, is frequently asked by operators: “How are the orders? Will they close us down? What is the future?” I asked JJ whether he had discussed our work with the board of directors.

> “I already informed them that I am in a discussion with you and that you are helping me with the possibility of a review of the entire activity and the future activity of Canon Valve and they say, ‘okay JJ, congratulations.’ But maybe one day they will want or maybe next week they will want to, to see a part of our work, or the results of our work.”

JJ's position had been consistent throughout our meetings. He would wait for his moment to involve the board constructively in discussions about the future and about investment. In his eyes:

> "On the question regarding timing, it's not because I'm scared because for example, I can bring all the data and I can write an email in 10 minutes to the board of directors with five or ten major things related to the future of Canon Valve as I see it. But I know the people with whom I work and I know that they are moving slow, they have other major things in their head and I need to wait for the perfect moment in order to do this [discuss the investment plan]."

The prospects of understanding more about the perspectives of others and to find an accommodation between various views were dim. Another reason was Canon Valve's size in relation to the rest of the group:

> "But on the timing and on the way I present this potential investment plan because, for me, one thing is clear, we are the smallest (company) in the group and no one wants to deal with it [discussion of the investment plan]" (JJ)

Timing was also impaired by a political battle that had developed among some of the company's shareholders.

> "They fight each other. And from this fight, I need to choose carefully how to position Canon Valve, but also to give them the impression and the reality of the fact that Canon Valve is on a different path. And to not let them get to a point to decide to get them to shut down the company. So, I need to persuade one side and another side that it is important for Canon Valve to continue activity." (JJ)

This "fight" was about a range of issues and interests. The land value was one such issue. It continued to appreciate. Three years ago, the land had been valued at €1.9 million, now it was closer to €4 million and its market value could be "two times that value". The board had discussed the prospect of a sale or

part-sale, on and off, for over five years, but no decision had been taken. A disposal of the site would mean that Canon Valve could potentially repay the loan provided by CV Parent in full, with the remainder of the proceeds being distributed in the form of dividends, or in investment funds for a new facility for Canon Valve outside the city, where the price of land is much cheaper. Shareholders think differently about this issue, its timing and the consequences for the factory operation. They also have different opinions about the future of Canon Valve. According to JJ some are sanguine, preferring to preserve the company's legacy, prepared to argue for its continuity and giving assurances to this effect, other less so. The continuity of Canon Valve depended on an alliance between those shareholders and directors who believed in the turnaround project started by JJ and his management team, and those who were willing to give it time to continue, knowing they had the appreciating land value as a form of insurance against further losses. Extending the systems study to other stakeholders in the hope of finding an accommodation of views might jeopardise the alliance that in JJ's eyes was keeping Canon Valve afloat. For this reason, the systems study had reached the end of the road.

4.4.5. Outcomes

Did the intervention solve the client's problem? This might be answered with a very tentative yes. The problem was about making some tentative steps towards planning Canon Valve's future. It was about how to create an investment strategy. In the client's eyes:

> "We can reflect that we are satisfied with this. We managed to put on paper and to get a clear view of how it looks today for Canon Valve, and how it might look in the future, even if there are 5 or 6 possible scenarios. But I think we manage to pull things all together and we see how they look differently to when we started the discussion."

The client had greater clarity, a new perspective on matters and as a consequence the ideas were now documented. The work produced a documentary record for ideas that were running around in the heads of the management team.

The intervention produced some insights and some learning along the way. These tended to be about personal understanding, mainly outcomes of reflection, more self-awareness about how some of the problems had been framed. For example, when considering the systems model to “produce a realistic investment plan”, and specifically the activity labelled as “assemble market intelligence”, JJ conceded: “I stopped thinking how to improve this and what to do about it.” The activities and the links between activities in the model are stark if you take the logic seriously. Assembling some form of market intelligence logically precedes what capacity might be required by the group to meet market needs. From here, depending on the mix of products and prices, Canon Valve would be able to assess the implications for their operation and adjust their strategy accordingly. But the management team had stopped thinking about how they could influence this. This was understandable. Their job was to keep the company afloat. But presented with a logical model of a pure concept to create a realistic investment plan, something which they now wished to address, enabled some useful moments of reflection and debate. This learning had been prompted by the use of logical models and by persistent questioning. Who is to say whether new framings would occur regardless of the method and the intervener? A ‘new pair of eyes sees new things afresh’. Any other method might have been as equally likely to produce new understanding.

There were “serendipitous findings” too. These emerged as much from the modelling as they did through lucky coincidence. An example would be the options for new site locations which were considered in the Strategic Choice Approach (SCA). The Jucu site was clearly Canon Valve’s least favourite option because it was 32km from the current site, and was felt to be too far away for staff. But the Jucu location had a considerable advantage over other sites because it was already owned by CV Parent, so a land purchase was not necessary. SCA asks users to consider inter-related decision areas and so a modelling choice to link the site location decision to a separate decision area about “when?” was introduced into the problem area. The management team felt that a move within 18 months to Jucu was an incompatible combination. “Why?”, I asked. “Because there is no way we can set up a 2000m^2 site in such a short amount of time”. In effect this meant moving the machining *and* the foundry within 18 months, something which they knew was unlikely to happen.

By representing decisions in this way, they had stumbled across a defence of the other three site locations, all of which they preferred to Jucu. By moving to a site of 1000m^2, extendable to 2000m^2, at a future date, which was feasible in the case of Vâlcele, Desmir and Baciu, Canon Valve would keep its options open. It could defer any decision to operate a foundry again until the reasons for doing so were settled. The same could be said of Jucu, but Canon Valve's occupation of half the site would prejudice development of the other half, if it chose not to build a new foundry. These are small points, potentially helpful to JJ in his negotiations with the board of directors, whenever this opportunity arises. He felt "better prepared" after going through the decision analysis.

The SCA approach also helped settle the debate that the management team had about whether the part-sale of the site or a complete sale would be in the best interests of Canon Valve. In the "review interview", I asked CB whether he had changed his mind.

> "Yes, exactly. Initially the investment plan was based on two things, which were contradictory. We didn't know how it would be better: part-sale or complete-sale. But after we dig and we dig, we found out that part-sale is not so good for Canon Valve. Complete sale would be our best outcome."

He added:

> "The investment plan in the first phase [using SSM] was very good because it helped me to differentiate very well and to work out what is important for Canon Valve"

The conclusion to phase 2 was, in effect, a very modest "commitment package". The management team would continue to find ways of increasing the board's confidence in the management of the operation. They would not "push" CV Parent or the board of directors on the subject of investment unless invited to. If an invitation was forthcoming, they would discuss their preference for a complete sale of the site, a new machining, painting and assembly facility at a new site close to Cluj-Napoca, with the option of re-building a foundry later, depending on market conditions. They had arguments to support their case and were ready to take further actions to help support a final decision.

These are the positive outcomes from the case. By the standards set by the client in section 4.4.4.1 it might be argued that the intervention was successful. If, on the other hand, the standard was set a little higher, or in the words of the client: “Michael, you will help me to make Canon Valve great again”, the jury is still out on that one!

I now turn to some of the limitations of the intervention. The fact that the study was not broadened – especially to other stakeholders - is partly explained by aspects of the culture of the organisation and in particular the authority to make decisions; by preferences for a particular problem-solving philosophy, and by judgements made about acceptable levels of risk.

4.4.5.1. Hierarchy, power and decision authority

Canon Valve is a hierarchical organisation with clear lines of authority and decision-making authority. It operates more like an autocracy than a democracy. JJ, the general manager, is more than likely to contest some of this, especially the label hierarchical. Perhaps the label was more appropriate to the past. For example, according to JJ, the previous director had a “communist mentality”, he was always in formal attire and would not mix socially with the staff and with operators. JJ has done much to change this, he gets to know his staff personally, he knows the names of their families, he eats with them, organises social activities with them. I was invited to the staff kitchen and there were few signs of “us and them”. But aside from these largely symbolic issues, there seemed to be clearly assigned levels of authority and responsibility and a high level of respect for different offices and functions. The demarcation issues that LL was dealing with, were an indicator of these. In some situations, relief was expressed that authority was assigned to someone else. JJ stated:

> “If I want to sell something, [for example an asset which is no longer required] I need to inform the board about this. So, all the time the responsibility stands on the shoulders of the board. But the hard work or the low work must be done by me. One thing is clear, and it makes me so happy because it removes part of the responsibility from my shoulders.”

At other times decision making was circumvented. At one point the management team wanted to improve the infrastructure, to replace some pipes that were contributing to energy losses. Instead of asking the board of directors for permission, which was the rule, they took it upon themselves to engineer a solution. “Why?” I asked. JJ’s answer was frank: “Because it would take a lot of time and to wait two months to get a positive answer, please do it or do not do it [imitating the board’s spokesperson’s voice]. So, I wanted to do something fast…I could not stand it anymore.”

How frequently does the general manager get to talk to shareholders and to CV Parent directors, for example the CFO, who is a member of the Canon Valve board, about the future of Canon Valve? JJ explains some of the contact:

> “Yeah. Almost weekly. For example, yesterday I got a call from our CEO assistant while I was talking to you. He's Romanian and I told him about our work. Okay, he's just an assistant. He's not the one who's taking the decisions, but very important. Two weeks ago, three weeks ago, he gave me a call and he told me that everyone is happy with Canon Valve's results, which from what I know in the past five years never happened. This was a good sign for me. Okay, I knew it without them having to tell me, but it was a clear sign that someone is seeing that Canon Valve is on the right path.”

On another occasion, when I was exploring Canon Valve’s knowledge of CV Parent’s appetite for investment, JJ related a story of a conversation he had had with the CEO of the CV Parent group. The CEO listened to JJ’s hopes and plans to re-open the foundry at some point in the future. He listened for a “full 10 minutes”, before suggesting that JJ should “concentrate on what he has now”. For JJ, this was “small progress”.

There is little to suggest, therefore, that communication channels are blocked or impaired in some way, but there is plenty of evidence that the organisation, and perhaps the group, leans to, and perhaps prefers, an autocratic form of decision making. This weakens the prospects of doing a fuller systems study, of

“sweeping in” more perspectives to determine a way forward for the operation in Romania.

The management team are realistic and at times, and as mentioned above, *fatalistic* about the future of Canon Valve. Perhaps this is a hard-won lesson of working in authoritarian conditions. “If it is a part-sale”, JJ muses about the worst outcome for Canon Valve, “then we’ll stay here. You need to accept the things that come to you, and then when they reach you, you then react.”

This was a “bottom-up” study using systemic PSM. At the outset I had likened the intervention to a community OR type study. The concern about social impact was highly important. One of the major differences however is the degree of hierarchy, power and autocracy present in the case, something which is much less noticeable in community OR settings. The presence of hierarchical conditions and of power interests has long been recognised as a major hindrance to SSM in particular (Jackson, 2019) and interpretive systems approaches more generally. Here the debates have tended to be about whether the approach will inevitably lead to conservative outcomes in favour of the dominant group, and whether any debate among stakeholders about what action to take can be fair. But the wider point seems to be that given the prevalence of hierarchical forms of organisation, a more considered view about the reach and scope of systemic PSM is possible.

4.4.5.2. Problem-solving preferences

I spoke to JJ about his preferences for problem-solving. What was his philosophy? What kind of approach was he trying to instil at Canon Valve? “Quality is everything”, he replied. Faulty valves used in the oil or water applications can have devastating effects, causing potential damage to life and to the environment. A closed fuel valve can shut down power to an operation causing a chain of events leading to losses and potential accidents. Reducing “claims” to an absolute minimum is a necessity for valve producers. JJ had been trained in quality. He likes to follow PDCA routines, using small experiments to work out special cause variation. He is methodical but certainly does not approve of over-elaboration or over-engineering.

JJ has a systematic approach to problem solving. When he took over as GM he identified problems and delegated many of them to his team. Slowly the company reduced the problems. “If you solve these small things, the result of these small things can be a huge benefit in the future.” Whenever he looks at the CNC machine, for example, he thinks about effectiveness, efficiency and operator safety, “never just one in isolation.” This steady, step-by-step approach has brought rewards according to JJ. There has only been one “claim” in the last year. Previous to his taking over there had been 49 claims in just one year, “Can you imagine!”, he says with some disbelief. He tailors his knowledge of ISO 9001 to the situation, acknowledging that its company-wide aspects are helpful, but can become impractical when applied to non-core areas. ISO 9001 can be “too detailed” and “bureaucratic”.

What was his reaction to the systems models produced during the intervention? They reminded him of ISO, meaning a little too synoptic. He preferred something more focused and manageable, something that identified the priority for action:

> I'm not an engineer. I appreciate the work of engineers. And every single time I have worked with someone who is an engineer I almost always say something like this. They are too technical. A process definition is too technical. This is a more holistic approach for sure. In order to understand how an activity, for example, producing valves or producing some product you can have a *diagram of some vital aspects*, but which are not technically a suite of processes, working one after another. So technically this [referring to the systems models] give you the possibility to establish a holistic view of what you have and what it will be suitable for you to see as a priority, as a *subsidiarity*.” (emphasis added)

JJ is quick to identify a problem or priority and to focus on it. The systems maps were probably too detailed for his liking. In the quote above he acknowledges that the “big picture” has its place, but the essence needs to be identified quickly. This creates a dilemma for proponents of the systems approach and a reminder of the need to manage complexity during an intervention. This

intervention took a “Wilsonian” approach to the soft systems modelling (see chapter 2), a “Checkland” version of 7+/- 2 activities might have been more appropriate.

However, it would be reasonable to say that JJ was ambivalent about the modelling:

> “So, what I want to tell you is that three months ago when we first had our discussion, our horizon was like this [he gestures with his hands to show something relatively small]. Now after we started to put things on paper, even I started to see things a bit differently. Not because I didn't know these things, but I didn't see them. So inter-connected, you know?”
>
> “I never wanted to go so deep, but still after we put them on the paper it looks a bit different than three months ago.”

I sensed some resistance and so asked him if he was resisting the identification of different scenarios and options.

> “Maybe, because I created this personal resistance. When I started to go deeper and deeper, I found out that as I dig and I go deeper, in fact there’s little to be gained in going further… I had so many scenarios in my head and after the last scenario, I managed to evaluate the situation. It felt like being at the beginning again, so I thought I should put an end to further inquiry and I should just let things happen.”

This creates a paradox for systemic PSM. In order to derive some learning, in order to reframe understanding of a situation, practitioners have to make things messy, trying to sweep in different perspectives. This is the key to learning new aspects about the situation. At the same time the problem needs to be structured so that action can be taken. Both these things had been achieved, even if the next actions were modest, but at a personal level it appeared to be a somewhat tortuous journey for the client. JJ was generous in conceding that the experience had changed his perspective. He and his team had got something out of it, but it is safe to conclude that the style of problem solving represented

by systemic PSM grated with his own preferences for problem solving. With more time he may have come to realise how fluid and quick the methods can be, but applications of soft-OR tend to be one-off events (Tully et al, 2019) which limits the possibility of cumulative learning.

4.4.5.3. Risk, timing and closing down debate

The final assertion emerging from the case is about the judgement concerning risk, which was referred to in section 4.4.4.2. This was the critical point in the case where both the problem solvers and the clients realised that the intervention could be taken no further. A fragile alliance among certain shareholders was keeping the company afloat. This alliance depended on the perception and the reality that Canon Valve was on the "right path" to recovery. After several years of late deliveries, financial losses, claims for defective products and a lack of cooperation with CV Parent, Canon Valve was on borrowed time. There was no room for error. Any risk to the alliance posed an existential threat to the company. JJ considered his own responsibilities in relation to this matter.

> "I am vulnerable too. If something goes wrong, for example in quality, and we have a huge claim from a customer and I am not able to manage this problem, it will be my head that will fall first! There is a huge responsibility on my shoulders."

Every intervention carries risks. The balance of power and timing meant that to barge into the board of directors and ask for their views on investment would have been unthinkable. This issue of risk is bound up with the comments made about autocracy, power and decision making above. If, in the eyes of those who hold power, there is no legitimacy for a systemic-PSM intervention then it is not going to happen.

4.4.6. Summary

This case illustrates the difficulties of a "bottom-up" application of systemic PSM. A form of autocratic decision making is prevalent at Canon Valve which is partly explained by the history of the company and its dependence on CV Parent. Without the approval of the wider group systemic PSM can only go so

far. There was evidence that the intervention re-framed the way the client thought about his problem situation but paradoxically the journey to that re-framing was difficult. Systemic PSM can feel like knowing a lot of the territory and the detail. It can feel like comprehensive planning. The client preferred to act more spontaneously, reacting to events.

4.5. “Communication issues” – Systemic PSM in a retailer

Romflower SLC, a pseudonym, is an upmarket chain of retail florists in Romania. A private limited company, it has enjoyed spectacular growth in recent years with sales nearly tripling since 2013, and profits doubling if one compares 2013 with 2018 (the intervening years show some fluctuations in profits). Part of this growth can be explained by favourable market conditions brought about by Romania’s accession to the European Union (EU) in 2007, with the free movement restrictions for workers were lifted in 2013. This was when Romania’s diaspora to Germany, Spain, Italy, and the UK took effect. Migrants built new lives in these countries, leaving loved ones and friends behind. One way of being remembered to those back in the home country is to send cut flowers, plants, or gifts. Romflower has capitalised on this and has created the infrastructure to meet the demand: a well-known, upmarket brand, a versatile website, a network of 9 stores and franchises located throughout the country, a buying operation with over 20 years’ experience, and a delivery infrastructure.

Domestically, the company sets up retail operations in luxury malls and in affluent parts of Romanian cities. One example is Cluj-Napoca from where the company is run by its charismatic founder owner and entrepreneur, NN. He started the business with just one florist shop in 1997. In the early years, the business was a bit “chaotic” and poorly organised. But now (in 2019) it is established, stable, and well organised with 119 staff. There are plans to improve the business further and to expand to other countries. NN has his own management philosophy, which he claims is loosely based on the ideas of the author and motivational speaker, Simon Sinek. But he concedes he knows less about management and more about being an entrepreneur. At some stage he would like to appoint a CEO to Romflower so he can turn his attention to new enterprises.

Despite the healthy growth, NN believes the company should be growing at a much quicker rate. He believes it could be more profitable too. Many projects to improve the business have been talked about and some have started, but implementation is slow, and frustration has set in. The owner complains that there is far too much “doing and not enough thinking”. There are

“communication issues” and there is a palpable sense of mild conflict or frustration between the owner and his management team. Some of the management team are relatively new, indicating that there might be some labour turnover concerns. How might a systemic-PSM work in this situation?

4.5.1. The setting

Romflower’s offices are located in the heart of Cluj-Napoca’s cultural centre. This is an attractive part of the city; busy with lots of footfall. A flagship retail store occupies a corner unit with good frontage to the busy road with its heavy traffic and many pedestrians, commuters, and visitors. The offices are a little further up after you pass the store. Three separate doors straight off the street lead to variety of offices, a studio for photographing floral art displays for Romflower’s website, and a small call centre at the back of the building, which takes orders and coordinates deliveries. Some of the company’s employees are outside the building, enjoying the late spring sunshine, taking a break, smoking, catching up. The main meeting room, or boardroom, is above the store. You have to walk through the store to get to the narrow winding staircase that leads to the room. This is where NN entertains visitors and holds important meetings with his senior management team. Walking through the store is a sensuous experience, pungent aromas from the cut flowers and bright colourful displays in every direction. At the rear is a smaller air-conditioned, specially lit room, designed to prolong the life of roses and other cut flowers. Tall racking is devoted to potted plants and orchids. There are several staff, some are wearing black polo shirts with a Romflower logo. The boardroom is modern, light and well designed with natural light coming from a big window fronting a quieter street. You can just make out the soft faint music coming through the shop below.

The first time I meet NN, he is with his wife and has just returned from a meeting with the company’s bank. I tell him about my research and try to make an “elevator pitch” about systems thinking, about emergence and holism. We also talk about my work at Canon Valve which is a useful reference case. Behind NN is a large wall display listing all the departments in the company, mounted on colour card:

1. HR and Communication
2. Marketing & Sales
3. Financial Accounting
4. Acquisitions and Logistics
5. Quality
6. Expansion and PR
7. Strategy

Against each department are a list of numbered goals, activities, projects, and responsibilities. There are as many as five hierarchical levels, with the first number representing the department number, the second a major goal or function of the department, the third a sub-function etc. A function, general responsibility or goal is split into a number of steps, and these are split into projects. Individuals' names are sometimes assigned to the projects, but not in all cases. The display is very detailed and structured.

At first, NN is a little sceptical but as we begin to talk about some of the issues the company is facing and how a systems study might work, he becomes more curious. We discuss a range of potential areas of work: trying to embed the ERP system to get the performance measurement system working; trying to improve communication in the business; developing a strategy for international expansion; and examining the structure of the business, how information flows and how knowledge is shared and created.

At the end of our first meeting, we agree that I will send NN a list of potential projects and a bit more detail on how it will all work. After he's had the proposal for two weeks or so I call him. "Yes, let's start something, Michael, when can you get here?" I ask which proposal he prefers. "Come to find out about the business a bit more, we can then see what to do. You need to see the business a bit more."

4.5.2. Client, problem solvers, problem owners

The client for this project is NN, which is self-evident. The problem solvers include me and the Heads of Departments (HoDs); NN too, to some extent. It was difficult to expand the notion of problem owners to other individuals and groups beyond the obvious cases of NN, the HoDs, the florists (stores), the

franchisees and the general workforce. As the intervention began to unfold, franchisees and florists became increasingly peripheral, and it was judged that the main problem situation was of little or no interest to suppliers or customers, suffice to say that the latter group would benefit from any agreed improvement.

4.5.3. My interest and involvement

Was there something in the Romflower project which was particularly conducive to a systemic PSM approach or was the opposite the case? Romflower is a private limited company and so on first impressions it seemed a little too self-contained. The most striking feature of the case, at the beginning, as indeed throughout the intervention, was the owner's commitment to his management philosophy which in his eyes, as mentioned above, was based loosely on the work of Simon Sinek (2014). I had not come across Sinek's work. Later I would find out that the "Be-Do-Have" model, that the client regularly repeated, is associated with leadership and coaching (see Hallet, n.d., for an example of this). Hallet (n.d.) suggests that the model is used by Steven Covey in his book *The Seven Habits of Highly Effective People* (Covey, 2013). This type of management idea is not taken too seriously in the academic world, save for research into management ideas and fashions, and how they influence managers, or, how they help to define what management is, which also accords with the manager's beliefs (Clark & Salaman, 1998). This case might shed light on how important these ideas are for the management of Romflower, and how systems ideas would either complement current practice, or be resisted.

4.5.4. The intervention

The intervention took place over two one-week periods in June and July 2019, equivalent to two phases. The first phase was about finding out; the second phase introduced a number of models for discussion, followed by some quick decisions to take immediate actions. A meeting at the end of phase two allowed the client and the main problem solvers to review the intervention and take stock.

4.5.4.1. Phase one – finding out

I spent just over two hours with the owner (client) on the first day learning about the business and its way of managing projects. Soon after, I was introduced to the Heads of Departments (HoDs) or members of the management team, save for one who is located at another site, a warehouse and logistics facility. The client was very open and welcoming. We built a good degree of understanding quickly and together we explained my role and purpose to the management team, who were also very open and receptive. There was good access throughout the entire intervention, It was easy to arrange interviews with all the managers and use the boardroom as a working area, when it was not occupied by others for meetings.

Designing the methods of intervention was also straightforward. The client had shown no preference for either of the four proposals sketched out in earlier email correspondence and seemed quite content in letting the problem focus and definition unfold through discussion. SSM's generality made it the most obvious choice in the circumstances. I was also conscious that the viable systems model might be used in some way to reflect on the concerns that had surfaced about communication and control. The main topic of discussion was the number of projects that each department had been set and the unique way that the company defined these projects.

There is day-to-day, routine work in all departments, something which was labelled as "business-as-usual" in the models below, and there is *project* work. The latter is similar to how projects are understood conventionally, but they are built or defined in what the client calls "BE-DO-HAVE cycles". There is a strong emphasis on the *writing* of projects, on defining them precisely. First, the management team has to agree the BE dimension. NN explained:

> "We agree the idea of seeing. To be the same for everyone [all HoDs]. And then we can start. The most important thing is that we don't start to write [the project] without the BE, the ideal for this project, what is going to be the ideal scene - if everything is perfect. What will the ideal look like? We agree this, together."

The next requirement is to have some form of measurement, a key performance indicator (KPI), which might be agreed more locally, perhaps between the owner and the HoD responsible for that project. The KPI will certainly be discussed by the management team because the measure of performance is implied by the “ideal scene”. The HAVE aspect of the model is effectively the results and these are measured by the KPIs. The DO is the “doing”, and NN is less interested in this. He wants to see results, and claims he is not so interested in how things are done. So, the BE is the most important strand of the trinity, followed by the HAVE. But logically, sequentially, the model runs in the order of BE-DO-HAVE.

Once the BE, or ideal scene, has been established, its consequences for other departments are also documented. “There is a mirror”, NN explains. For example, if the marketing department wanted to create some up-selling configurations – e.g., a bouquet plus a certain vase – the same configuration would be copied into stores; this would also have ramifications for the buying team also, so the paperwork had to be documented to all affected departments. The same BE-DO-HAVE logic would need to be followed. What would be the “ideal scene” in the buying department and so on etc. If a performance measure was established at a higher level - for example, in the case of the marketing team designing an up-sell configuration - there would also be a KPI for an individual florist, so that a florist could determine their performance against the metric. The paperwork could therefore be lengthy. A marketing employee (ME) said: “literally I wrote once, 20-30 pages, that was a lot for just one, one small title [project].” “Is it difficult?”, I asked. ME: “It's complicated It's very complicated. I want to say it's not making things easier. Okay. You have to make it complex. But it’s just over complicated.” Another interviewee concurred:

> “Until now, nobody knew what a [Romflower] project is. We have a 16-page project [document] about projects from NN. He's trying to explain how a project should be done, how it should be made, and implemented. But I don't think all of us … understand it 100%, maybe around 50%, 60%, and that's why everything is moving so slowly. And I think NN - he is frustrated because of that.” (Head of Strategy)

I learned later that there had been an event where all of the management team were taken offsite to discuss the vision 2 years ago. This was where some of the overarching projects had been defined and the structure of the organisation determined. This explained some of NN's frustration. Another contributor was franker about why project implementation was so poor: "The major problem here is this system to be honest, this system BE DO HAVE." This same employee had searched for explanations of the model on the internet, thinking he could improve his understanding and thereby make the communications improve. But he could only find one or two old videos online. I made my own searches and found the context usually related to personal coaching, where an individual would aspire to an identity (BE someone), do activities associated with that BE (the DO) and enjoy the results (HAVE). It seemed out of context with the management of projects.

The interviews with staff were not exclusively about project implementation. There were of course many other issues: GDPR, quality, ERP, relationships with suppliers, relationships between acquisitions and florists, plans to incentivise employees, relationships with franchisees, building and security issues, task management software, and general information systems related issues. But the overriding, central theme was the management of projects, many of which would address some of the "other" issues. And the main message was clear, things were slow to change because of projects and the way they are designed and managed. This had specific links to the BE-DO-HAVE model.

The manager of the acquisitions and logistics department has been with the company for several years. Her main responsibility is to buy flowers from the exchange in the Netherlands. I ask: "How many projects do you have?" "I think 41, yes 41." "How many have you completed?" Laughing, she says six are completed. "That means you have 35 to complete by December 31st." "Yes." She replies, laughing. The acquisitions manager is more optimistic than all of the other managers. But she estimates that she has, at best, one day in every five to work on project tasks. It is not the case that she can devote one day a week and that will be enough because she needs the cooperation of others, the projects are cross functional. From the Head of Strategy, I learn that there are over 200 projects to be completed by the end of the year. It is now late July.

All HoDs were interviewed and a number of additional non-managerial staff. The same underlying theme about projects emerged. A “rolling” rich picture was explained to the various teams, and I left this in the offices inviting contributions. Most of the drawings made mention of projects and time-related pressures. The rich picture is shown in figure Figure 4-14.

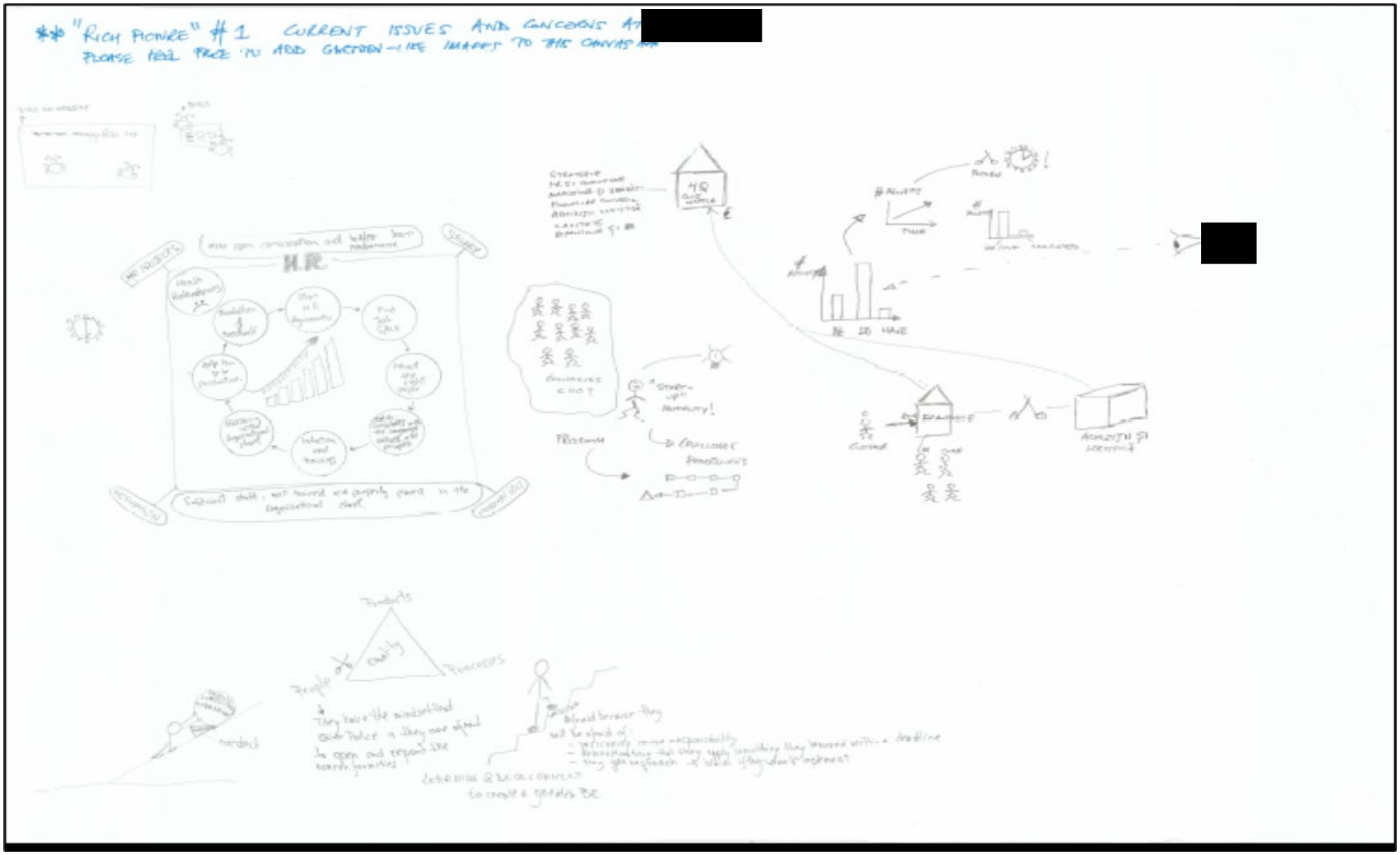


Figure 4-14 Rich Picture – Romflower

By the end of the first week (phase 1) I took stock of the intervention with the client and the head of the strategy department, effectively NN's second in command. The main aim from my point of view was to agree some relevant systems to model. For the client, it was an opportunity to decide whether to continue the study or to terminate it. Some of the staff had formed good perceptions of me, trust had been built, so the intervention would continue.

Everyone seemed to have enjoyed constructing the rich picture and seeing each other's contributions. The client wanted to discuss this further. The most sensitive point was of course the controversial BE-DO-HAVE model and staff members' perceptions of this. The client is very attached to this model and this way of seeing the world. When I first met NN he insisted that many business are using this model, but I could see no evidence for this. He was defensive when I said: "I am not convinced that everyone fully understands the BE-DO-HAVE philosophy." He explained it to me again. I persisted with the argument that whatever its merits, it may be one of the reasons why project implementation is slow. He conceded that he may have to get someone in to explain the model in more detail.

The discussions with the departmental managers were useful in stimulating ideas about relevant systems to model. I did not attempt to get the management team to perform any modelling. This would only add to their time pressures, but the relevant systems were heavily influenced by their concerns about time pressures and the number of projects. The owner (NN) had more time. He also had a thirst for learning about soft systems thinking. Later, he and I would design a quick model (not shown here), about a flower club membership scheme. This helped him to understand the modelling principles and showed how the ideas could be quickly learned, especially if a learner is as open as NN, willing to try, an active learner. I agreed some tentative models with the owner and the strategy manager, which directly addressed the problems of unrealistic timescales for projects. I had in mind a number of models written from a general worldview that it makes sense to prioritise the projects and not be overwhelmed by them. I would also use the data collected in the interviews to perform a

rudimentary viable systems diagnosis. We agreed to meet in 4 weeks' time after returning to the UK.

4.5.4.2. Phase two – From models to action

In advance of the second meeting the client was sent an interim report containing three SSM models and an image of the VSM. The SSM models were created using the client's language. It was a small concession to the BE-DO-HAVE model that appeared to be the root of the communication issues and tensions. Root definitions and systems models are in a "being-doing" relationship (Wilson, 2001). The root definition explains what the system *is* and the model contains the *doing* activities. There is no equivalent to the concept of HAVE, suffice to say that the monitoring and control activities of all conceptual models remind users of an implicit pre-conceived measure of performance. The models were presented on the big screen in the boardroom. The client and later the Head of Strategy were present.

Two of the three models are presented below These two models became the subject of much debate and were deemed more relevant. Systems definitions are prefaced with cartoon-like diagrams below which attempted to depict the transformation.

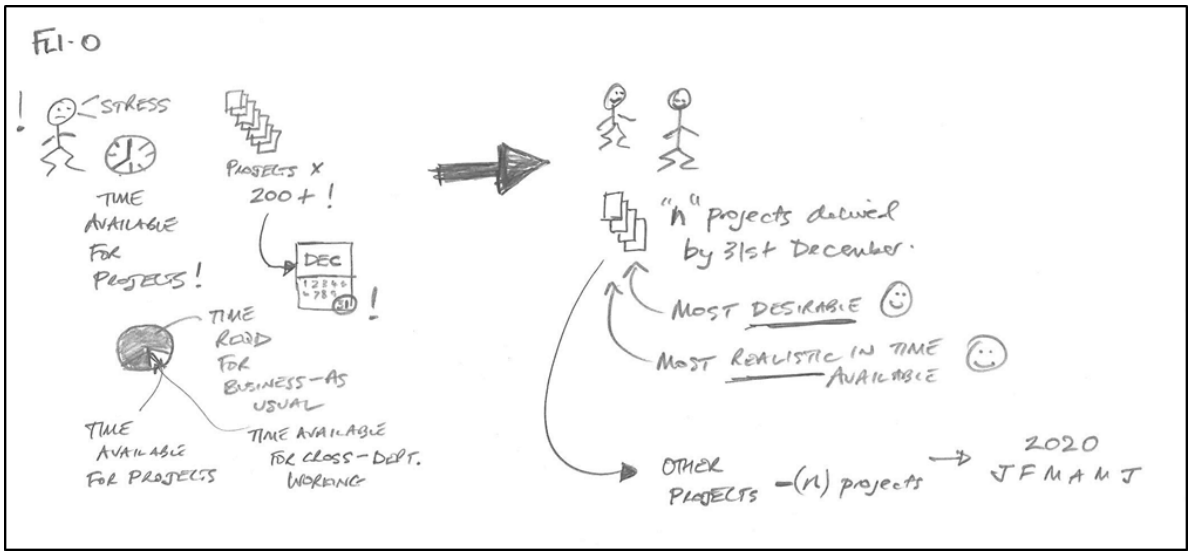


Figure 4-15 Diagram of Transformation for FL1.0

FL1.0 System Definition	A system - owned and operated by the 7 departmental heads - to select, prioritise and agree a schedule of the most desirable projects which can be realistically delivered by December 31st 2019 so that a balance can be achieved between "business-as-usual" (BUA) (routine) work and new project delivery, subject to the satisfaction of the owner and in accordance with the short-to-medium objectives of the business.
Notes and definitions	"Business as usual" tasks are routine, day-to-day tasks; they are *not* project tasks. They refer to the day-to-day activity of the departments
System Transformation	Non-prioritised, entire project list by department. Uncertain about which projects occur when. All to be delivered by 31st Dec 2019  Prioritised, scheduled, realistically deliverable and highly desirable projects list which can be delivered 31 Dec
Worldview underpinning this systems model	Agreeing *n* projects to be delivered by the 31st December rather than *all* projects is more realistic and will create a better balance between BAU and project work.

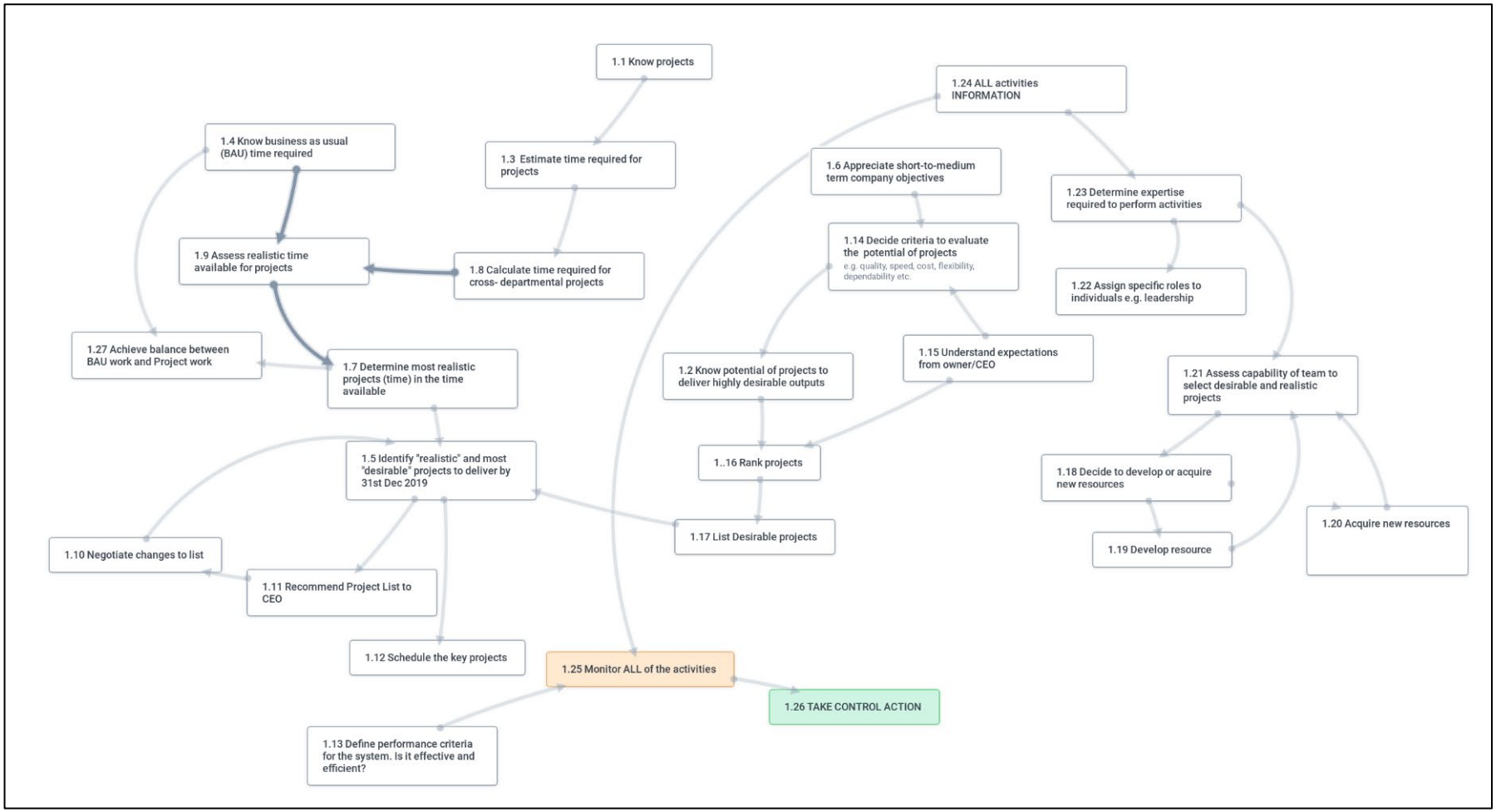


Figure 4-16 "FL1.0 Model"

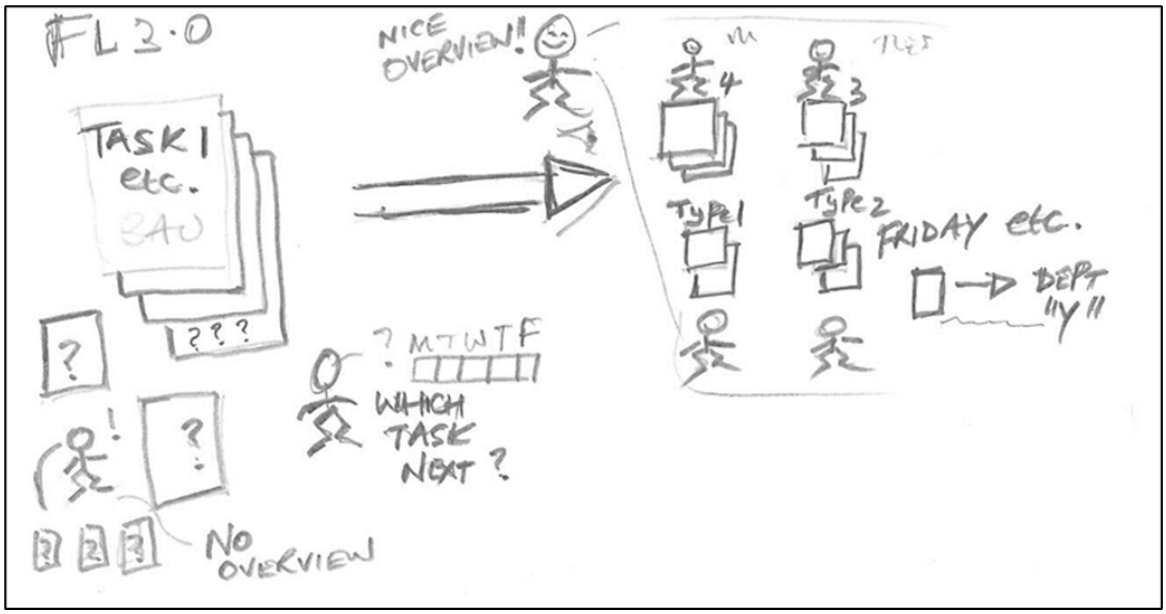


Figure 4-17 Diagram of transformation for model FL3.0

FL3.0 System Definition	A system operated by a head of department to oversee, organise, assign and prioritise departmental, "business-as-usual" (BAU) tasks by reviewing, on an ongoing basis, the current and future BAU work demands for the department which takes into account the demands of wider project initiatives and is operated in accordance with company values and the company constitution, in order to contribute to the overall effectiveness and efficiency of the company.
Notes and definitions	"Business as usual" tasks mean routine, day-to-day tasks, *not* project tasks. It refers to the day-to-day activity of the departments
System Transformation	Unknown, disorganised non-prioritised **tasks**, not "overseen" → Organised, "overseen" directed **tasks**
Worldview underpinning this systems model	That better oversight and organisation of routine tasks will lead to greater effectiveness and efficiency

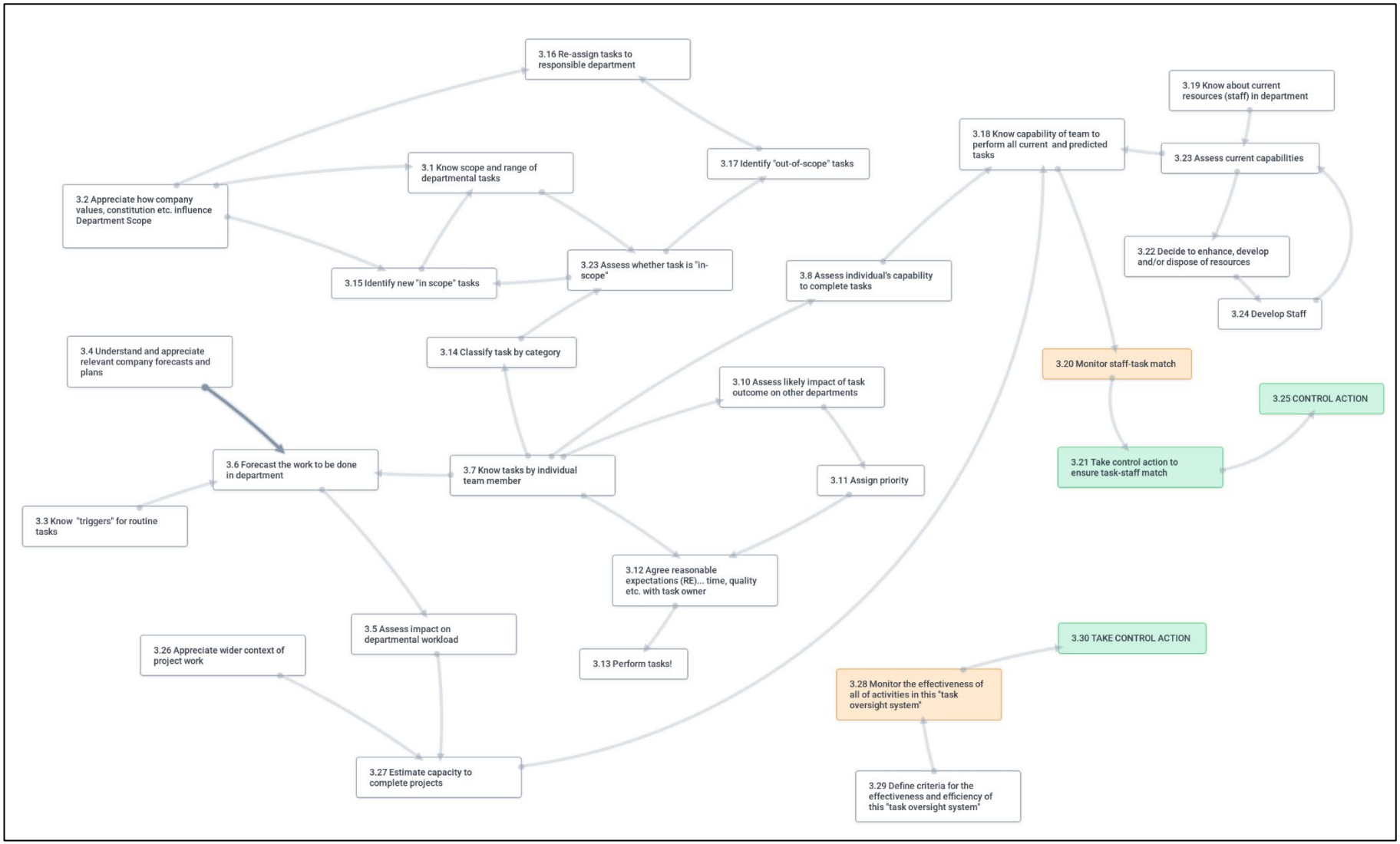


Figure 4-18 FL3.0 model

These are simple but abstract models. Both are similar in the sense that they try to manage the balance of time assigned to everyday activities that keep the business going, and the time available for project work. Model FL3.0 (Figure 4-18) shows managers getting some kind of overview of the weekly workload, and to assign some kind of priority. The organisation has made enquiries about some task management software, so the idea of getting a better overview of tasks was not alien to the managers. They had decided to defer the purchase, but it was reasonable to ask about the 'perceived-problem-that-might-be-addressed-by-software' and whether this was still considered problematical. There was general agreement that the activities in the model made sense. They would be copied into a comparison table and translated into Romanian (by the Head of Strategy). It was proposed and agreed that Heads of Departments would use it as a means of reflection only. How were they keeping an overview of the tasks for their department and how happy are they with their own performance in this regard? The head of strategy would collect the results and they would discuss the matter as part of an agenda item for a team building event held on another site.

The first model (FL1.0) was also very simple but envisaged a very different set of consequences, ones which the client might find difficult to accept. In essence the proposal was to shrink the number of projects to be completed by the 31st December to something more manageable. Selection of projects would be determined by criteria and would be agreed between the departmental manager and the owner. The actual number of projects to deliver was not specified. It would just be reduced to *n* projects, whatever the managers thought they could deliver, taking into account routine work. This would be difficult for NN to accept. He said:

> "Do you know how long we have had the projects, Michael?"

I did not know the exact origin, but it was now July 2019. NN explained:

> Since 2017. First, I started in, let's say, in 2017 sometime. Then it's 2018, 2019 and 2020 next. I just told them, please write this work on the project, please, please, with no deadline. And then when the end of 2018 came, I said, okay,

> but I cannot accept more than 31st December of this year to finish it. They did nothing in the first month. It was March, which is very busy for us. And I know it's not easy, but I started to, to put more pressure. At first no pressure. This is my way. I see it doesn't work. Just a little bit more pressure and then leave it a bit more. But, of course, I will be more open if I see them trying. And I didn't put the deadlines. I let them, now we have hundreds of projects. Let's treat them until 31st of December to work on. But I didn't start it now. I started years ago."

We went back to study some of the activities in the model and to the cartoon-like diagram that explained the transformation. NN is full of praise about the work we had achieved so far:

> "It's really nice. I do really love this kind of thing you do. It shows me exactly what is happening. It's really interesting to show it this way.

Referring to the rich pictures, NN said:

> "Management's also about fun. And this is what is missing to me. I don't know how to make them [his management team] laugh. But this way can be a little bit interesting."

I explain the main consequence of the model:

> "Let's say, for argument's sake, that it's 50 or 100 small projects are going to be delivered between now and the 31st of December, and the remainder will be scheduled for some time next year. Okay? Now, I am not saying you have to accept this."

"No, I accept it.", says NN, and "Are you suggesting me to take the pressure off. Yeah? true?"

"Not entirely", I reply.

NN: "A little bit?"

“Yes”, I reply.

The head of strategy also agreed to the idea of trying to focus on the most important projects in the time available. “This is a good idea.” she said. Later, after understanding how the two models were related, she said: “This is a very good idea.” Those involved had reached an agreement, an accommodation of views.

Numerous agents in this case showed a great latitude to see things differently, which is a compliment to the team ethos at Romflower. Several participants had mentioned that they enjoyed the teamwork at Romflower. This flexibility led to decisive action. The owner in particular was very open and reflective: “I know a little bit more, because I need to change something about me.” Whether this would lead NN to reconsider his BE-DO-HAVE philosophy is left open. I am doubtful. I explore this further below.

At this point, the Romflower intervention came to a close.

4.5.5. Outcomes

Several outcomes flow from this study. Some have already been referred to above in order to preserve the logic between the methods, models, discussion, and the consequential actions that were then taken. Here, in this section, the emphasis is on how participants responded to some of the methods, and how they evaluate them especially vis-à-vis extant problem-solving approaches.

The rich picture and the improvised cartoons that showed possible transformations served a number of purposes. The first, and most important, is how the rich picture allowed relevant problem owners, problem solvers and even the client, to express some aspect of the problem situation as they saw it. This of course has long been recognised in the literature (Wilson, 2001). But it is worth pointing out that in this case, low levels of conflict could be represented without these becoming too emotive and threatening. The second aspect was The fun element:

> “These images are really nice. It tells you something about the situation and where we are going. And in a nice way. It also makes you smile. They are really nice.” (NN)

The images were also showed in the management meeting so that everyone could discuss it together. “We put in on the screen. And the team like it. They recognize the diagram. It’s funny. Really. I loved it.”

The improvised cartoons for transformations were also helpful – perhaps because of language barriers – but also because they took the attention away from the root definitions which are wordy and cumbersome. The images are a useful preface, before discussion of the activity models.

The models were simple. They depicted abstract systems that people normally take for granted. Participants were patient in looking at the activities that make up the whole, systematically checking whether an activity offered some opportunity for improvement. One such activity was to appreciate the interconnections between departments when working on projects. An indirect outcome of the study was that the manager of acquisitions moved her office, which was located in a different building. This enabled her to be closer to the marketing team. Many of their projects overlapped, and proximity was seen as an improvement.

Depending on perspective, it is possible to see these outcomes as trivial. Tension was building because the owner had put his managers under pressure, a third-party comes in and forges a compromise. But the models help to show different perspectives, and show how different activities can contribute to improving the situation. An accommodation of views is made. The intervention is done relatively quickly, enjoyably, effectively and with plenty of participation in the outcomes. I now turn to the long view. Will the participants consider using any of the methods in the future? How does it compare to the extant problem solving approaches the business uses?

4.5.5.1. Complementing or displacing extant PSA

The most striking difference between the way Romflower currently works and the way of seeing and acting through systemic PSM is a matter of philosophical perspective. It is effectively the difference between agreeing *actions* to improve a situation and trying to agree what the *ideal* scene must be and then creating a project that will deliver the ideal scene. The former is pragmatic and achievable, especially in the flux of events; the latter is idealistic (by definition) and rare to

achieve. Checkland & Poulter's (2006) soft systems thinking has long since recognised this with their distinction between "accommodation" and "consensus". Individuals in problem situations will have very different views, but they can reach an "accommodation", agree some action to improve the situation. Genuine consensus is much rarer, but this does not stop individuals agreeing to take some actions which hopefully improve things (Checkland & Poulter, 2006).

Would the Romflower team take anything away from the experience? Would they use any of the tools? NN was very attentive throughout. He asked many questions and was very keen to learn: "it's nice. I will learn this. It's really nice.", he said at one point.

How did it compare with his own philosophy of management? NN:

> "I don't know if it is better than my way [laughter]. Mine is very logical, technical. Systems Thinking is a little more creative, more you have to take problems and solve them this way."

Understandably, both the Head of Strategy and NN thought they needed longer to fully understand systems thinking and would want to see it applied to different situations. NN was trained as an electrical engineer. He was comfortable with the modelling and made considerable effort to understand the systems diagrams. His suggestion to me was to conduct an experiment, to have one organisation managed with a systems approach and another, a control, managed without. This belied his engineering background:

> "Yes, I am the engineer type. To me it must be about math. Everything must be like mathematics. So, logic, numbers and also the human brain - trying to put it in mathematics. Cause I'm not such a philosophical man. Everything I see this way. Mathematics, logic."

How difficult is it for individuals to change their perspective? The organisation-as-machine metaphor was still evident in our final discussions. "Why is the mirror so important?", I asked.

> NN: “So everybody knows what he has to do, and he doesn't need to ask. He can see his performance and other’s performance.”

The wallchart behind NN, see Figure 4-19, the careful numbering of the projects, his notion of mirroring, all pointed to an owner-manager who liked an ordered existence, a structurally sound system of operation. He recognised that his organisation could be viewed as an organism too. Referring to the wallchart:

> “It’s not good to change that much, but it's something changeable. We say it's alive, but we don't want to change it that much. So, for every rectangle, there has to be a statistic. At least one. It shows someone's doing something and this is his performance. We want to add their pictures with their faces. And then they will feel more responsible for that. For that specific thing you know.”

Figure 4-19 Wallchart - Romflower Boardroom

NN's predilection for models was evident in his comments about the soft models we had created. Referring to the models he stated:

> "One very important thing is missing here. The date. Here you must write the date, because tomorrow maybe you have to shape it in a different way. And that takes time. Maybe you need a program. I see here you're using Plectica,"

I had mentioned that the models could be discarded once action has been agreed. "They are devices for learning.". I was only keeping them for research records. NN's inclination, perhaps because of his background, was to give all models special status. Models are important to him. In comparing the wall chart with the soft models he said:

> It has taken a year or so to develop [the wallchart diagram] and every meeting I am showing them [the managers] that diagram, and we are discussing it every time. It's taken a year or two to put it really deep within me. And you explained to me a new idea in two days, you know!

Another favourable comment was made about the speed of the soft systems modelling:

> "When I saw how easily you did it [create the models], how fast you design it. It means you understand it deeply, something your brain was practising, your brain understands this."

When I asked if he would use some of the tools again, he replied: "Good question". He thought he needed more practice with the ideas. The methods were "not complicated", but NN and the management team, thought they could not use the methods to their full potential without working with them in more applications. Was it a problem of language, of translation? "No, but *the idea* is complicated."

The intervention was deemed a success. It had generated insights and actions, but there was insufficient time to make the methods and tools habitual, or second nature. It was unlikely that NN would relax or reform his ideas about BE-

DO-HAVE, not that this was the purpose of the study. Wherever this technique originated – from Sinek, Covey or elsewhere – it was firmly rooted in MGs management approach. It was an unbudgeable commitment, a matter of personal belief. I asked “You're going to persevere with that [BE-DO-HAVE]? There's no change, you’re not going to change your views?”

> NN: “No, no, no, because I see the same thing happening every day around me. I see it here. I see them [his managers] *doing things without thinking.*”

4.5.5.2. Generic and specific modelling

Was systemic PSM very different to the problem-solving approaches the client had experienced? NN’s view, as stated above, was that soft systems thinking was less technical and more creative than Romflower’s bespoke approach, but he still found it difficult to fully articulate a differentiating factor. Reviewing SSM he said: “it's really nice. It's not very different...But it is.” At one point during discussions on one of the models he asked: “Let me ask you something for a second? This [the model and comparison table] is available for any company almost? This is matching, it could be any kind of problem. It’s not so specific…” The models in this case were indeed very general, and theoretically, with one or two adjustments, could easily be applied to similar situations where a group of managers is trying to strike a balance between time devoted to routine work and time for project work. This was a keen observation by the client, and one that marks the debate about generic and specific models in soft systems thinking. The latter thought to be more helpful in differentiating systemic PSM; the former perhaps more relevant to clients.

4.5.6. Summary

Romflower is a small, fast-growing, and successful company run by an entrepreneur who is busily curious about new ideas in management. The company has an informal and open culture. But tensions had started to grow regarding the slow implementation of projects. Systemic PSM was used quickly to generate insights, agreements, and actions. It was perceived as a successful intervention. Much of the modelling was simple and generic, even if it was about abstract transformations. The modelling was felt to be pertinent to the

Romflower situation, and potentially to other organisations facing similar situations. Generic modelling is debated in the literature (see Wilson & Van Haperen, 2015 and Jackson, 2019). It offers the potential for “quicker” forms of systems interventions which may improve the take-up of systemic PSM.

4.6. Conclusions

This chapter has shown four examples of systemic PSM in action. The aim has been to provide a narrative description of the events that took place in each case, and to begin to explain why events unfolded in the way that they did. Some of the interventions were deemed to be more successful than others in addressing the “action agenda”, and some were better received than others by the managers who contributed to the research. A number of themes have begun to emerge from these empirical studies. Taken together, these themes narrow the conditions under which systemic PSM can be effectively applied. This has implications for the wider adoption of systems thinking and systemic PSM; it has implications for the assumed demand for systemic PSM. Some of the emerging themes are known to the literature, others are represented less well and require further development. This chapter has examined the cases intrinsically. The next chapter will make comparisons across cases in order to drive the emergent theory.

Chapter 5 – Findings and Reinterpretation

5.1. Introduction

The preceding chapter concentrated on *what* happened in each of the case studies and began to hint at patterns, understandings, and explanations. The cases were presented in a narrative form so that any interested reader could compare them to similar cases known to, or experienced by, the reader. They permitted a form of “naturalistic generalisation” (Stake 1995). This chapter focuses on *why* the cases (interventions) unfolded as they did. It begins with some cross-case analyses which attempt to summarise the cases using various forms of template analysis (Miles, Huberman & Saldana, 2018; King, Brookes & Tabari, 2018). These findings suggest there is an *indifference* towards systemic PSM, especially when compared to existing problem-solving approaches (PSAs). In some situations, this indifference may harden into a form of aversion, where systemic PSM is deliberately avoided or repudiated in specific circumstances.

The empirical material can only go so far, and the chapter seeks alternative interpretations by adopting a more sociological perspective and exploring the complex social systems theory of Niklas Luhmann. The analysis and interpretation suggests that systemic PSMs might be accepted, and have the potential to be taken-up, only in circumstances where the decision logic of an organisation has reached a hiatus, because a decision is contested, and as a result of this an organisation becomes more receptive to external descriptions. This raises serious questions about the assumptions made by critical systems thinking and Soft OR which are taken up in chapter 6. The current chapter begins by re-visiting the empirical material.

5.2. Cross-case comparisons and analysis

The analysis and reporting of findings in this section comprises three templates and a causal chain diagram. Table 5-1 below is largely descriptive and summarises the main features of the cases, the methods used, a researcher judgement on the effectiveness of the intervention, and an indication of whether further work applying systemic PSM in the case organisation was likely or

desirable. These judgements are highly subjective, but take into consideration the narrative from chapter 4 and are based on the candid discussions and reflections with clients, after the action research part of the case was completed. The Romflower case is somewhat of an outlier, in that the prospects for further enquiry were very good, and if time allowed a further project could be commissioned.

Table 5-2 makes comparisons between existing problem-solving approaches and systemic PSM. Again, the main purpose of the table is to summarise the interventions, but the table also reveals that many of the difficulties identified with existing problem-solving approaches also apply to the participants' experiences of systemic PSM. Time pressure is a consistent theme. Difficulty and confidence (lack of) in applying the methods is also evident.

A Summary of the Interventions

Intervention	Country	Sector	No. Phases	Prior Experience of Systemic PSM	Outcomes Actions and Decisions	Researcher Judgement of Intervention Effectiveness	Potential for further application with the client
CC	UK	Public	2	None	Specification of workstreams were drawn up and issued.	** Effective	Considered but declined.
GMC	UK	Charity	3	None	The *process* of using the models helped to think about the issues facing GMC at a critical juncture.	* Satisfactory	Declined but several months after the case the client called the researcher to ask for help in recommending and advice in using a systemic PSM (CLD/Strategy Mapping) in a new project.
Canon Valve	Romania	Private	3	None	Preparedness for broader discussions with CV Parent managers and the Board of Directors. Clarity on possible future scenarios for the company. Documented potential schemes.	* Satisfactory	The Board were aware of the systems study but did not want to see or continue the work at the current time.
Romflower	Romania	Private	2 main phases	None	Agreement was reached such that: (1) Departmental Managers would make spend more time managing time devoted to BAU and project work. (2) That the most desirable projects would be delivered, and others would be postponed until the next calendar year.	*** Very Effective	Future work was discussed. The initial work had produced very quick results. It was agreed that further work could take place. But the client was concerned about the researcher's time and costs. Enough had been done to demonstrate that systemic PSM could achieve results and be adopted.

Table 5-1 Descriptive Summary of the Cases

Comparing Existing PSA with Systemic PSM

Intervention	Extant PSA Practices, Behaviours, Principles & Labels	Extant PSA Evaluation		Systemic PSM Methodology & Methods	Systemic PSM Evaluations		Evidence of "Internalised Systems Thinking"
		Approval Expressed	Frustrations Expressed		Favourable	Adverse	
CC	Meetings. Formal and Informal projects. Project Management Work streams. "Deep thought sessions". "Block and wreck". Incremental and steady change "project management thinking" "critical thinking" "Assumption testing"	Comfortable [with it]. Familiarity. "Endorsed".	Stakeholders not effectively brought together. Tends to create silo thinking. Some linear thinkers and linear thinking do not help. "Layers of political complexity"	Strategy Mapping (SODA)	Enthusiasm was generated during the workshop. Good engagement in the workshop. There was *some* surprise value. The process created some understanding. It was [more] useful for others [more junior members]. Gave voice to some problem solvers who are not always heard.	Not novel. Would not feel confident applying [the methods] without training. Not "endorsed" by the council. No toolkit provided to apply the methods. Lack of training. Insufficient time. Transparency not possible. Models are time consuming to produce. Does not address time pressures. "Can't just focus on problems in their own terms" because of political "layers". Models would "scare" some individuals	Some (client) Some "as a matter of course" (attributed to others [clever people], by the client)

Intervention	Extant PSA Practices, Behaviours, Principles & Labels	Extant PSA Evaluation		Systemic PSM Methodology & Methods	Systemic PSM Evaluations		Evidence of "Internalised Systems Thinking"
		Approval Expressed	Frustrations Expressed		Favourable	Adverse	
GMC	Against orthodoxy "no one mention Prince2". Conventional formal board meetings Ad-hoc, informal meetings. Openness to outsiders for comments and co-creative efforts. Thematic analysis. Trend analysis Informal plotting (thinking) Discussion through various fora and conferences. SWOT	A need for novelty and creativity is generally thought to be met by creative, committed people. Tools and ideas used are in common circulation and are part of "etiquette".	Time pressures. Meetings "go on and on." Recency bias blocks out "quieter facts"	SSM in "mode 2". Rich Pictures Conceptual Models Comparison Tables Strategy Maps (SODA) Causal Loop Diagrams	Rich pictures were thought provoking and thought to be very shareable/ memorable. Lines of enquiry were quickly abandoned in this case (Impatience? Rather than practicality). The "process" of thinking was helpful. "Triggered ideas" Pulling together disparate contributions Gets you the 20% that is insightful. Provides some "legitimacy". Useful for others, provides "consent"	Insufficient confidence to share a systems approach with the wider organisation or network. Systems studies perceived to take too much time. Too many questions. Too much analysis and thinking. Rapid changes in the sector would make the information/ learning from a systems study become dated quickly. *Process* preferred over outputs (models) Models – stating the obvious. "Laborious" - going through the "80% you know". Departing from "accepted ways of practice" [in order to	None detected (client). But some attributed to others.

Intervention	Extant PSA Practices, Behaviours, Principles & Labels	Extant PSA Evaluation		Systemic PSM Methodology & Methods	Systemic PSM Evaluations		Evidence of "Internalised Systems Thinking"
		Approval Expressed	Frustrations Expressed		Favourable	Adverse	
						use systemic PSM] carries risks.	
Canon Valve	Quality Management PDCA Special Cause Variation Systematic analysis ISO9001	Quasi-Experimental. A questioning style works well "Socratic", testing assumptions. Measurement. Some first-order cybernetic black box thinking. Preference for Action	Inability to understand the root causes of problems (attributed to other managers) Communist styles of management (authoritarian) "Previewing" (forecasting) and planning – more of this was required. Arrested thinking about certain dimensions of problems. Lack of consideration for social impacts of operations. Too detailed (ISO9001 and some engineering approaches) Too bureaucratic (ISO9001)	Rich Pictures Conceptual Models Comparison Tables Strategy Maps (SODA) Strategic Choice – option bars, comparison criteria, UE and UV analysis.	Helped to change perspective. Felt better prepared for discussions about the future with the Board. Helped to focus and differentiate key aspects of the situation	There are too many scenarios and there is a danger of going too deep of paralysis by analysis. Fails to find a *focus,* a priority, an action. Widening the problem context tends to lose focus on what can be done "here and now".	None detected.

Intervention	Extant PSA Practices, Behaviours, Principles & Labels	Extant PSA Evaluation		Systemic PSM Methodology & Methods	Systemic PSM Evaluations		Evidence of "Internalised Systems Thinking"
		Approval Expressed	Frustrations Expressed		Favourable	Adverse	
			Finding priorities, finding the essence quickly.				
Romflower	Projects (c>200!) "Be-Do-Have" method "Be-Do-Have" cycles Quality Management ISO9000 Written project definitions. Extensive project documentation. Management by objective KPIs	Very detailed project specifications are seen as the means of overcoming problems and obstacles.	Project implementation failures Improvements are slow to achieve. "Slow to change". Be-Do-Have is complicated. Not everyone understands it.	Rich Pictures Conceptual Models Comparison Tables VSM	The rich pictures show exactly what is happening. The rich picture images helped participants to express concerns in a non-combative fashion. Realistic about seeking accommodations between different perspectives. Systems thinking is more creative. Systems modelling can be quick.	It is difficult to master. More time is required to learn how to model. It is OK if you have experience. The models are logical but not "scientific" or "mathematical" – they lack rigour and proof.	Highly detailed and structured thinking is in abundance but no sense of "softer systems ideas" is in evidence.

Table 5-2 Approval and Disquiet about Existing PSA v Systemic PSM

Table 5-3 attempts to summarise the frustrations and difficulties that case study participants experience when they attempt to address complex issues and problems. These themes are amassed from conversations that took place after each intervention. They include difficulties and frustrations which are experienced with existing practices *and* with those experienced using systemic PSM. Frustrations and difficulties with existing practice are listed first in column one (marked as *E*), followed by those that emerged or were reported through the experience of applying systemic PSM (marked as *S*); the assumption being that new approaches to problem-solving bring along new frustrations or intensify existing ones. Additionally, an approximate frequency logic has been applied to the ordering of themes, with those difficulties shared by most or all case organisations appearing in the highest rows. The columns describe various methods or tools used in the interventions, ordered by the researcher's perception of assumed difficulty in application. Thus, rich pictures are assumed to be an easier concept to grasp and to apply, than are causal loop diagrams. The ordering is a matter of debate but given earlier comments (see chapter 2) about the tendency of "analysts" – not least the inventors of the methods themselves - to take model development away from the participants' gaze, there is some justification. At the intersection of tool and theme the relevant case study intervention is listed. A cell is shaded green if the tool or method used in the case was deemed to address the difficulty/theme, and pink if not. Cells with question marks reserve some measure of doubt.

Variable by Variable Matrix

Frustration/Difficulty with problem solving approaches	Case Study	Rich Pictures	SODA Workshop	Strategy map (model)	SSM conceptual model	SSM Comparison Tables	VSM	Causal Loop Diagram	Strategic Choice (Decision Scheme)	The Process of *Systemic PSM*
General time pressures in addressing and managing problems (E)	CC GMC ROMFLOWER			CC	GMC ROMFLOWER	GMC ROMFLOWER				
Finding priorities, finding the actions quickly. (E)	CC CANON VALVE GMC		CC	CC	CANON VALVE GMC	CANON VALVE GMC			CANON VALVE	
Inability to understand the root causes of problems (attributed to other managers) (E)	CC CANON VALVE									CC?
Stakeholders not brought together effectively (E)	CC GMC		CC							
Silo thinking (E)	CC		CC							
Negotiating layers of political complexity (E)	CC CANON VALVE									
Creating legitimacy and credibility (E)	GMC									GMC
Options identification (E)	GMC				GMC					
Meetings “go on and on.” (E)	GMC									
Deciding preferences (among options) (E)	CANON VALVE								CANON VALVE	
Arrested thinking about certain dimensions of problems (E).	CANON VALVE				CANON VALVE					
Too detailed (ISO9001 and some engineering approaches) (E)	CANON VALVE				CANON VALVE	CANON VALVE				
Defining Projects is slow. (E)	ROMFLOWER				ROMFLOWER					
Some ways of tackling problems (e.g., Be-Do-Have is complicated). Not everyone understands it. (E)	ROMFLOWER	ROMFLOWER			ROMFLOWER	ROMFLOWER				

Frustration/Difficulty with problem solving approaches	Case Study	Rich Pictures	SODA Workshop	Strategy map (model)	SSM conceptual model	SSM Comparison Tables	VSM	Causal Loop Diagram	Strategic Choice (Decision Scheme)	The Process of *Systemic PSM*
New thinking and surprise/Creativity (E)	ROMFLOWER	ROMFLOWER			ROMFLOWER					
Communication Issues (E)	ROMFLOWER						ROMFLOWER?			
Project implementation failures (E)	ROMFLOWER				ROMFLOWER?					
"Slow to change". (E)	ROMFLOWER									
Novelty (avoiding repetition) (S)	CC GMC CANON VALVE				CANON VALVE	CANON VALVE				
Excessive analysis which forestalls action (S)	CC GMC CANON VALVE			CC	GMC CANON VALVE	GMC CANON VALVE		GMC		
Understanding and capturing the problem context in a fun way can be hard (S)	ROMFLOWER GMC CANON VALVE	ROMFLOWER GMC CANON VALVE								
Memory (Reminders/ recording) or Neglected thinking of parts of the problem context. (S)	CC GMC CANON VALVE	GMC CANON VALVE	CC	CC GMC	CANON VALVE	CANON VALVE			CANON VALVE	
Recency bias blocks out "quieter facts" (S)	GMC				GMC	GMC				
The models are logical but not "scientific" or "mathematical" – they lack rigour and proof. (S)	ROMFLOWER									

Table 5-3 Variable-by-Variable Matrix

Three observations are made about Table 5-3. First, as one moves from left to right, the frequency of pink cells increase. This may suggest that as the tools and methods become increasingly analytical, or are perceived as such, there is a reduced confidence in their ability to address the difficulties that were expressed about problem management. Secondly, the number of *new* difficulties (or recall of prerequisites for effective problem management) that arise as a result of applying systemic PSM, are relatively few in number. This may suggest that clients and participants see some additional benefit in using systemic PSMs, but these benefits are modest. Finally, some of the rows have no cell entries, suggesting that some of the concerns expressed by participants are simply not addressed by systemic PSM. These three observations are discussed in more detail below.

5.2.1. Avoiding "high-fidelity" representation

One interpretation of Table 5-3 is that as modelling of the situation becomes more analytical, more rule-bound and logic-driven, participants are more likely to question whether such efforts are addressing their problem situation. Rich pictures and getting together in a workshop format can address the need for novelty, fun, creativity, overcoming silos, and as a means for remembering aspects of the problem situation that have been ignored. The workshop might even help identify quick actions. But as the production of artefacts becomes more complicated or more logic-driven there are a mixture of evaluations. Morecroft (2015) refers to high-definition, high quality modelling as "high-fidelity". Clients and problem solvers from the CC, GMC and Canon Valve cases became concerned that the additional detail may forestall action, they question whether all of the detail is necessary, they observe that many aspects of any model re-produce what may already be known about the problem situation, or produce what participants consider to be self-evident. Only in the Romflower case was there sustained interest in the models and modelling, and this may have been related to the CEO's background as an engineer. His keen interest began when he was first introduced to the models, seeking to validate them against some imperceptible criteria. Later, when he understood their purpose as devices for creating learning, comparison, and debate, he asserted they were "neat". Romflower is something of an "outlier" or a surprise. Arguably,

the owner-founder of the company had above average curiosity in the intervention, more time, more patience, and more authority than clients in other case studies. But he also appeared to have little fear about what the models might highlight. There were no restrictions in this case on whom the researcher could speak to, nothing was to get in the way of learning, even if that meant criticism of the client himself.

In summary, the cases generally suggest that low-fidelity representations like rich pictures and various fora for participation require little pre-understanding and can be useful and stimulating. But as interventions move to more penetrating forms of analyses, there is increasing scepticism as to whether actions will be identified and decided on.

5.2.2. "Solving" problem-solving.

A wider discussion about the merits of problem-solving approaches meant that participants could make comparisons between systemic PSM and existing problem-solving approaches. This created further opportunity for participants to recall desirable features of problem solving that had not been mentioned thus far. These were few in number (see Table 5-3). They include the need to avoid re-visiting what is already deemed to be known about the problem situation, to avoid 'going over old ground'. Re-stating the "obvious", or the "known", forestalls action. At the same time, the CC, GMC and Canon-Valve cases all reported a positive feature of systemic PSM – that the experience had reminded the participants of aspects of the situation they had ignored, neglected or had simply not documented, as if the process of applying systemic PSM helped with memory. For the GMC client there was a recognition that existing practices suffer from a recency bias, where people she collaborated with wanted to talk about "the last things they had read or heard". Systemic PSM appeared to reduce the risk of bias but at the cost of bringing too much detail to light, which is trumped by the perceived need for action. This instance of participants' preference for action is corroborated by comments invited about the various artefacts produced during the intervention.

5.2.3. That which remains unsaid.

A number of rows in Table 5-3 remain unanswered, suggesting - in these interventions at least – that systemic PSM does little to address problems of political complexity and change. Furthermore, for the Romflower client, the status of the models produced by SSM are felt to lack rigour, objectivity and proof, a criterion which has been reported before as a factor contributing to the lack of interest among proponents of classical OR methodology (Ackermann et al., 2020).

Political complexity was a key feature of the CC and Canon Valve cases, and arguably contributed to the decisions to not take these studies deeper. In both cases, it was felt that further inquiry and modelling would reveal delicate positions or ongoing “fights”. Rather than believe that the methods could work as a means to seek accommodations between rival positions, there would be too much exposure, if these positions were articulated as part of the problem-solving process. It cannot be assumed political aspects of situations are immediately discernible to an outside problem solver. Here, they were revealed in the post-intervention interviews. The curse of Pandora’s box becomes a useful, if cliched, metaphor to understand and explain the indifference towards systemic PSM in these cases. The implication is that there are subtleties, beyond the reach of mere methods or, in the words of the key informant from the CC case, “we can’t just focus on problems in their own terms”. Curiosity, has its limits.

5.2.4. A preliminary summary

The variable-by-variable matrix and the summary tables can be brought together in a very tentative causal model which is displayed in Figure 5-1:

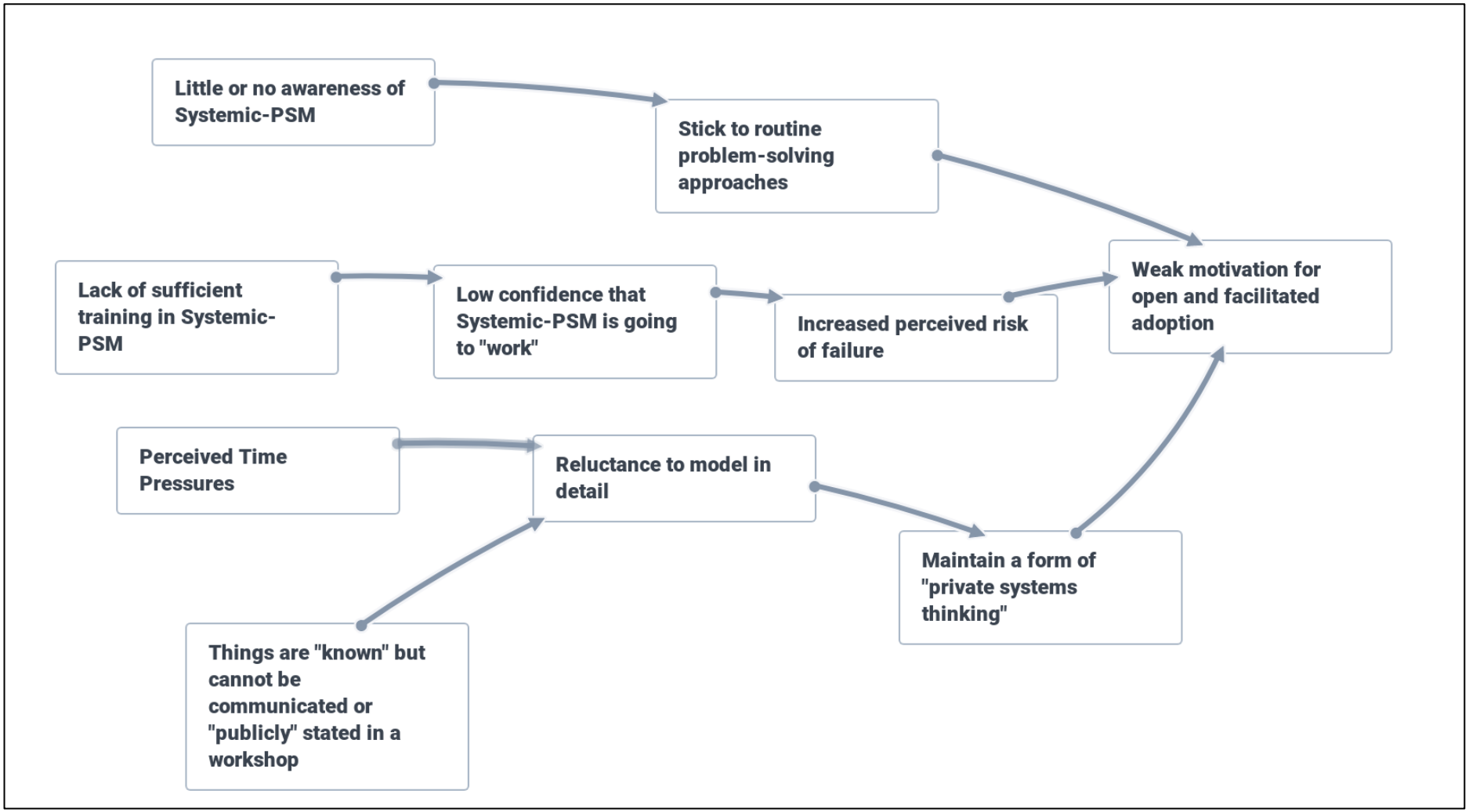


Figure 5-1 Causal Model

5.2.5. Limitations

The sections above attempted to identify patterns across cases. A common thread - no doubt influenced by the research design - was for participants to freely make comparisons between the intervention and existing problem-solving routines. It becomes almost second nature to make seemingly effortless comparisons: ‘my methods’ versus ‘your methods’, ‘my effectiveness’ versus ‘your effectiveness’, ‘my costs versus your costs’ etc. The danger is that interpretation is too easily framed as one of simple utility calculation, a question of benefits versus disbenefits, a realization that - even though there is a greater awareness and understanding of systemic PSM - existing approaches to problem management will suffice. Various forms of this type of “conventional” thinking – value thinking, instrumental thinking – continue to persist in and around the literature. Tully et al (2019) describe it as the “value paradox”. Jackson (1995) pits the systems approach against the fads and the fashions. But are these kinds of comparison limiting and does the conventional thinking that underpins them prevent us from making better insights and interpretations?

Several aspects of the cases invite, or “trigger”, further investigation; they call out for closer examination (Alvesson & Karreman, 2007). For example, why do interventions in seemingly complex organisational cases like CC and Canon Valve come to a completion sooner than anticipated? Why does an intervention in a seemingly straightforward organisation like Romflower take longer than anticipated? Why are some managers more curious than others? Why do some managers appear to be in a position to be more reflective about how things are done in their organisations? Perhaps a better understanding might be achieved by contextualising these questions alongside some additional theoretical resources, which provide a very different vocabulary to the ‘value-thinking’ implied in the above analysis. This is also an opportunity to reflect further on one of the key assumptions of interventions using systemic-PSM: that much of the work is done within the context of *organisations.* The next section brings back social theory to better understand organisations, to understand them sociologically and communicatively.

5.3. Complex Social Systems Theory - A Luhmannian Lens

Chapter 3 signalled that the case studies (the interventions) might profitably be viewed through the lens of relevant social theory (see section 3.5.5). A critical description of Luhmann's social systems theory aims to do just that, by directly addressing the research sub-question: How does the organization(s) - which is the main context for systemic PSM application – facilitate or constrain the deployment of systemic PSMs?

The account begins with some justification for including Luhmann's work. This requires a very brief description of Luhmann's vast work, followed by a justification of the inevitable selections that are required in order to prepare the ground for more productive interpretations of the cases. Sections 5.3.2 to 5.3.5 provide some background on Luhmann's core ideas. In section 5.3.6, the importance of *decision* in Luhmann's theory of organisation receives special attention. Organisations distinguish themselves from other systems by means of communications about decisions. Past decisions are the background for future decisions, and this is the "operation" by which an organisation continues its self-production (or autopoiesis) (Luhmann, 2018, p.ix). In the final part of section 5.3, I set out the implications of Luhmann's thinking for an analysis of the cases.

5.3.1. Justifying the choice of Luhmann's social systems theory

The choice of theoretical resources available as a means to re-interpret the case studies might easily be seen as overwhelming, so some justification for using Luhmann's complex social systems thinking is in order. According to Alvesson & Karreman (2007), surprise findings like those outlined in section 5.2.5 provide an opportunity to create a "dialogue" between the empirical material ('discovered' in the cases), the researcher (through reflexivity), and alternative frameworks. The latter can include philosophy, the use of metaphor, or social theory (Alvesson & Karreman, 2007). There is a long tradition of using social theory to support and underpin systems approaches (Jackson, 1992) and OR (Ormerod, 2020). This being so, there was little temptation to use philosophy or other frameworks as "dialogue partners" to help with the re-interpretation process. Even so, this leaves a vast range of social theories to choose from, and it is beyond the scope of this thesis to provide even a minimal

description of these theories. Ormerod (2020) provides a useful description of the many social theories that OR researchers have made use of, including functionalist, interpretivist, structuralist, and post-modern theories. It is also the case that researchers in systemic PSM cannot be expected to know more than a few of these social theories in any depth, especially if their time is split between practice and research. Of course, as Alvesson & Karreman (2007) point out, the more that is known about theoretical resources, the better the "interpretive repertoire" of the researcher. But limitations have to be accepted.

Looking back over the last 20-30 years of systemic PSM research, the most widely cited social theories are arguably critical theory, in the form of Habermas's three worlds theory, and practice based views, which have emerged through the work of Tully et al (2019), Ormerod (2014, 2017), Pickering (2010a) and others. Both these theories of the social were considered as candidates to use as frameworks to reinterpret the cases, and whilst they all would undeniably yield results, it was felt that Luhmann's complex social systems theory might yield far greater insight for four main reasons:

- Providing adequate *challenge* to aid greater reflexivity.
- Supporting a reframing that emphasises *organisation.*
- Knowing access to tangential empirical material. i.e., *decisions* was assured.
- Permitting a degree of **novelty**

The relative advantages of using Luhmann's complex social systems theory framework are explained as follows.

First, the strategy of using different theoretical resources to encourage reflexivity and to explore surprise findings, assumes that the chosen framework will be sufficiently *challenging* for the researcher (Alvesson & Karreman, 2007). It is likely to have a vocabulary that creates a different perspective in which to confront the empirical material afresh. Luhmann's ideas about autopoiesis, and communications as elements of social systems, achieves this level of challenge.

Secondly, Luhmann's theory of organisation directly relates to a specific aim of the thesis, namely to appreciate how the concept organisation - which is the main context for systemic PSM application - facilitates or constrains the

deployment of systemic PSM. How organisations are constituted becomes an important question as will be shown below. Of course, I do not underestimate how well the practice-idiom demonstrates how networks of activities, bodies and objects can create and re-create organisational phenomena (Nicolini, 2012).

Third, using theoretical resources to reinterpret surprise or unexpected findings may require further collection of empirical material. As will be explained below, organisations (for Luhmann) are produced and re-produced through decision communications, and data for these are broadly accessible given the research design for this project. Practice-based approaches often involve a micro-level study of objects and activities, typically requiring similar research methods used in ethnomethodology. A practice theory orientation is likely to require further periods of observation and empirical work, which may not be feasible after interesting findings have come to light.

Finally, Luhmann's complex social systems theory offers some degree of novelty, given that critical social theory and practice-based approaches have already been used with good effect to create knowledge of systemic PSM.

In some ways the choice of a ‘Luhmannian’ perspective requires little justification since Luhmann is a social *systems* theorist and uses some conceptual vocabulary familiar to those who seek to develop tools and methods of intervention for the management sciences or the management systems tradition. But his aims are much grander of course, seeking to develop a sweeping theory of society, and recognising too that this theory is developed *within* society. Luhmann draws attention to the fact that he does not enjoy some privileged position *outside* of, or *above* society, from which a sustained appraisal or commentary on social conditions can be mounted (Luhmann, 2013, p2). Here is a foretaste that communication – even communication about abstract theory – takes place *within* society. For Luhmann, communication is a “purely social category” (Seidl & Mormann, 2014).

If Luhmann’s aim was to create a sociological theory which explains all social phenomena, it is inevitable that some selections are required in order to meet the narrower aim here. What follows is a selection and ‘reading’ of what I consider to be the most relevant of Luhmann’s texts, pertinent to the question

about the likely prospects for systemic PSM. For the most part, I rely on Luhmann's (2018) key text about organisations: *Organisation and Decision,* first published in German in 2000, and translated into English in 2018. The publication of this major work in English will likely stimulate further investigations of what his social theory means for a whole host of topics including organisation, policy making, management, and consultancy (Cooren & Seidl, 2020). Luhmann's works have been somewhat marginal in debates about systemic PSM and management science generally. Mingers (1994, 2006) and Jackson (2019) are some exceptions, but the full implications of his work on *organization* have yet to be fully exploited. The same appears to be true for those making contributions to management and organization theory. The neglect is explained by the lack of translations into English, and the perceived difficulties and levels of abstraction in Luhmann's writings (Cooren & Seidl, 2020).

It is important to make plain (so far as this is possible given the level of abstraction that Luhmann achieves) some of the fundamentals of Luhmann's way of thinking; his borrowing of concepts and theory from other fields, and the specific terminology he employs. Without this, understanding of his general theory is made more difficult. The aim of this section therefore is to introduce some of the core ideas with economy, and avoid detailed theoretical descriptions which take the chapter away from its main purpose of providing an interpretive context for the case studies. Five core aspects of Luhmann's ideas are presented here, namely:

1. A general theory of organisation
2. Observation and theories of distinction
3. System types
4. Autopoiesis - communications as elements of social systems
5. Organisations as decided orders.

Items 2 through 4 have very broad theoretical range, important as building blocks for a wide range of social and psychological phenomena, and not just for theory relating to organisations. But the main interest here is a theory of organisation, and for that reason the first and final sections concentrate on the organisational domain. The basic contours of these five ideas are described in

the following sections and each section concludes with a note on the interpretive possibilities that stem from Luhmann's theorising.

5.3.2. A general theory of organisation

Organisations are generally taken for granted. They provide people with jobs that enable them to have more-or-less satisfying working lives, they provide goods and services, and they are regularly referred to as person-like entities, capable of making decisions. All of this is 'normal' and makes sense in order to negotiate everyday experience. But organisations are often easily taken for granted by researchers and practitioners too, in that their systems studies are commissioned by a decision maker, who commissions the work on behalf of an organisation. Only rarely is this fully acknowledged in the literature. Checkland & Holwell (1997) argue that the taken-for-granted aspect runs so deep, it is hardly worth setting out as an assumption. Nevertheless, we cannot escape that most work using systemic PSM takes place within the context of organisations, and the general assumption – which will be discussed in more detail in chapter 6 - is that these (taken-for-granted) organisations face complex, messy problems amenable to a variety of systems problem structuring methods.

Luhmann, as a sociologist, exercises broad licence in tracing the etymology of the concept - organisation - to the 19th century where there was a growing need to use it to describe objects, and, as an activity (Luhmann, 2018, p.3). From this point onwards, research on organisation began to grow and potentially reached a peak of interest in the 20th Century. Luhmann's survey of organisation theory across this period depicts it as one of finding "essences" (Luhmann, 2018). Research attempted to set out what organisations *are*. It attempted to define the *essence* of organisations. It drew attention to the formality of an organisation, the founding of an organisation, its culture, its structure, its size, and type (e.g., private, public). But all these ways of describing organisations are, for Luhmann, the *result* of decisions, and decisions lead to, generate, or connect to other decisions, as will be explained. Decisions (or more precisely the communication of decisions) are operational events, these events produce and re-produce the *form* of the organisation. A brand-new organisation, which is incorporated today comes into being as the result of a decision. For Luhmann, the communication of decisions is prime, and anything else in the organisational

literature, which claims to mark out the true essence of an organisation is secondary, it is the result of decision (Luhmann, 2018 p. 42). From this, it is also stressed that Luhmann's theory of organisation is concerned with *how* questions, *how* organisations produce and re-produce themselves through continuous operations. Finally, Luhmann does not offer a normative theory of organisation. With thinly disguised irony, he leaves this to the "abundant" and "lively business consulting" (Luhmann 2018, p.3). Instead he seeks to explain organisation from a sociological perspective.

How might this all too brief introduction to Luhmann's thought on organisation potentially help with the task of interpreting the cases? This is effectively a matter of emphasis. Instead of focusing on the *perceived problem situations* that the organisations in the cases face, attention is turned to how the organisations continue to maintain their existence and identity, in effect, how they self-reproduce within the context of those problem situations. Of course, for this section to have any meaningful claim to be an aid for more insightful interpretation, it needs to be read in conjunction with sections 5.3.3 to 5.3.6, below.

5.3.3. Observation and theories of distinction

For Luhmann, the concept of observation has "ultimate" status (Luhmann, 2018, p.100) and observations are performed by making *distinctions*. Observation as a concept is more "elementary", is more general, and has greater versatility than other concepts that pre-occupy the social sciences, for example the concept of action. The idea of observation combines the concepts of "distinction" and "indication", which Luhmann takes from Spencer Brown (1969) (quoted in Borch, 2011). When observation occurs, something is indicated and is distinguished from what it is not. For example, I might focus on a particular book by Luhmann on my desk (an illustration inspired by Borch, 2011, p.52). This *one* book is distinguished from all the other books and papers relating to Luhmann's work on my desk, as I write these words. In Luhmann's terminology the *one book* is the "marked side" of the distinction; the other books and papers are the "unmarked side" of the distinction. The "marked side" of a distinction and the "unmarked" side, together as one, create a "form" or a "unity" (Luhmann, 2018, p.101). An example of the notation used by Spencer Brown (1969), and

later by Luhmann (quoted in Seidl & Becker, 2006, p.13), is provided in Figure 5-2.

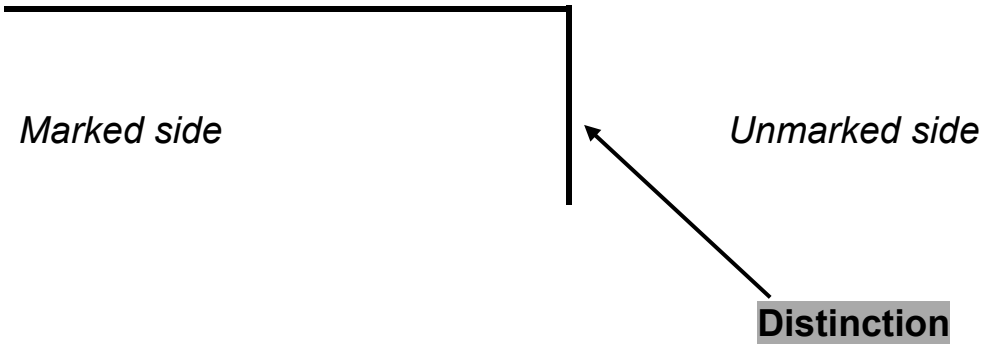


Figure 5-2 Spencer Brown's notation in Laws of Form (quoted in Seidl & Becker2006)

Observation and distinction can apply to abstract ideas too. For example, I can distinguish applied universities from non-applied (or research-intensive) universities. In doing so I am making a distinction, highlighting a marked side (applied universities) from an unmarked side (research-intensive universities). The distinction *indicates* at the same time as it *separates* from what it is not (Borch, 2011, p.52). The distinction has dual effect; it is "two-sided" (Andersen 2003, p.65). It enables the observation and excludes all the other possibilities. If I were to choose a different distinction, say applied universities distinguished from other educational establishments, I would be making a different observation. The distinction I decide upon, which to all intents and purposes is an "arbitrary choice" (Seidl and Becker, 2006), produces a different observation, a different *way of seeing*. All this may seem "obvious", but it has important consequences for the development of Luhmann's theory. First, there is a temporal dimension that requires further clarification and secondly more needs to be said about the observer that makes the distinction. These are discussed under two sub-headings below.

5.3.3.1. Temporality

In drawing a distinction, I indicate something and separate that something from the rest of the world at the same time. If only one side can be indicated at any one time, the other side which is not indicated (the unmarked side or "the rest of

the world") becomes, in a manner of speaking, 'temporarily lost'. This way of thinking can even be applied to the core concepts of system and environment. Usually, a system is said to reside in its environment. Living organisms, for example, are usually assumed to rely on *the* environment for essential inputs. And this conventional way of explaining system and environment implies that both sides can be "indicated" at the same time, which contradicts the above outline of the theory of distinction. Luhmann's point is that a system (and more will be said about different types of systems below) makes observations by using distinctions that distinguish itself from *its* environment (Borch, 2011). Because the system is the "marked side", everything else becomes the environment. This also means that the system can be "blind" to the "unmarked" side of the distinction, to its environment (Seidl and Becker, 2006). It is possible to connect this insight to the theory of operationally closed systems. A system's openness to its environment is conditioned by its own means of closure and separation, its own way of seeing, its own specific mode of distinction processing.

5.3.3.2. The observer that makes the distinction

The above paragraph makes numerous ontological assumptions about the existence of, as yet, underspecified observing systems, or systems that observe by making distinctions. This leads to a second important consequence of the theory of distinction. No distinction can be made without "*presuming* and simultaneously installing a distinction between the distinction and the observer who draws the distinction" (Borch, 2011, p.56, emphasis added). Luhmann often refers to this as "re-entry", after Spencer-Brown. The re-entry of the "form" of distinction/observer into the original distinction is depicted using the "laws of form" notation in Figure 5-3.

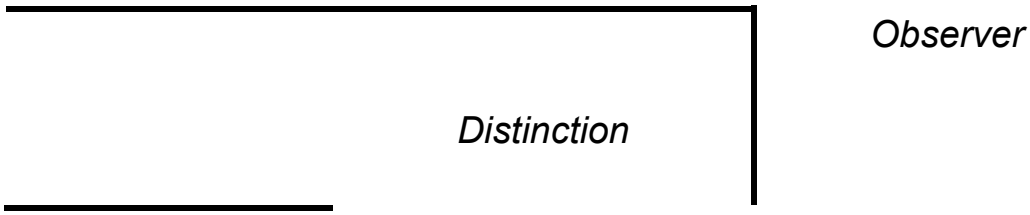


Figure 5-3 Distinguishing the observer from the distinction (after Borch, 2011)

Three implications stem from the recognition that the observer is 'present' in every distinction that is made. First, and in line with second order cybernetics (von Foerster, 1984; Achterbergh & Vriens, 2010c), the focus of attention becomes how observing systems observe. In the act of distinction, the system generates itself and can observe itself (Luhmann, 2018, p.30). In shuffling papers on my desk, trying to understand (!) the writings of Luhmann, for example, I become self-conscious of my tiredness and other mental states such as whether I find the theory credible or not. I therefore have some awareness of self, which is not fixed but is continuously updated (Churchland, 2013, loc. 1658). Secondly, it becomes possible to ask what are these systems that make observations? What type of systems 'exist' and how might they be specified? For now, it is best to assume that there is a "vast plurality of systems" (Borch, 2011, p.22) because this will be covered in the next section, below. Third, because these systems operate continuously by generating and processing distinctions there are, in theory, unlimited ways of seeing. This, for Luhmann, creates "indeterminacy", something that must be resolved. On the one hand this helps to explain the proliferation of complexity which for many is an undisputed characteristic of modern society (Luhmann, 2018; Jackson, 2019; Boulton et al, 2015). On the other hand, it prompts the question of how, given the multiplicity of ways of seeing, all of this complexity is constrained.

So, in summary the theory of distinction is just one entry point into Luhmann's unique way of understanding highly complex observing systems. The simple and pervasive act of distinction both indicates something, and at the same time separates it from what it is not. Together this creates a "form", and it is these forms, or "unities of difference", that fascinate Luhmann. They are a key part of his analytical strategy. It permits him to seek out distinctions that seem to make a difference, and to constantly question what is on the other side, what is excluded, and why this might be the case. Making and processing distinctions is so pervasive that it applies to Luhmann as well. As author of his book

Organisation and Decision he is processing distinctions, “distinctions that distinguish the distinctions of organizations” (Luhmann, 2018 p.ix).

What implications does Luhmann’s theory of distinction have for the purpose of providing better interpretations of the cases? The first is that it may be useful to examine the distinction that each case organisation uses to separate itself from the “rest of the world” so far as this is meaningful from a second-order observer perspective. In other words, Luhmann advises to choose the “distinction that the object of observation itself draws” (Seidl & Becker, 2006). And secondly, it may be useful to begin thinking about why the “vast surplus” of possible distinctions do not get “marked”, or are “disregarded” (Luhmann, 2012, p.15).

5.3.4. Systems and system Types

The section above has already established that the pervasive act of drawing a distinction involves indication *and* separation. The theory also presupposes the idea of an observer that makes the distinction. This observer can be understood as a system, or as a system type. A system comes into being when it separates itself from its environment and can begin to operate on its own (Borch, 2011, p.21). Again, the principle for Luhmann is that the identity of a system is built on a difference. It must create and maintain a systems boundary differentiating itself from its environment. This difference must be “produced and re-produced within the system itself” (Luhmann, 2018, p.16), and this “obliges” the system to consider its own environment.

But what kind of system types produce and re-produce themselves in Luhmann’s theory? A general classification is provided below in Figure 5-4.

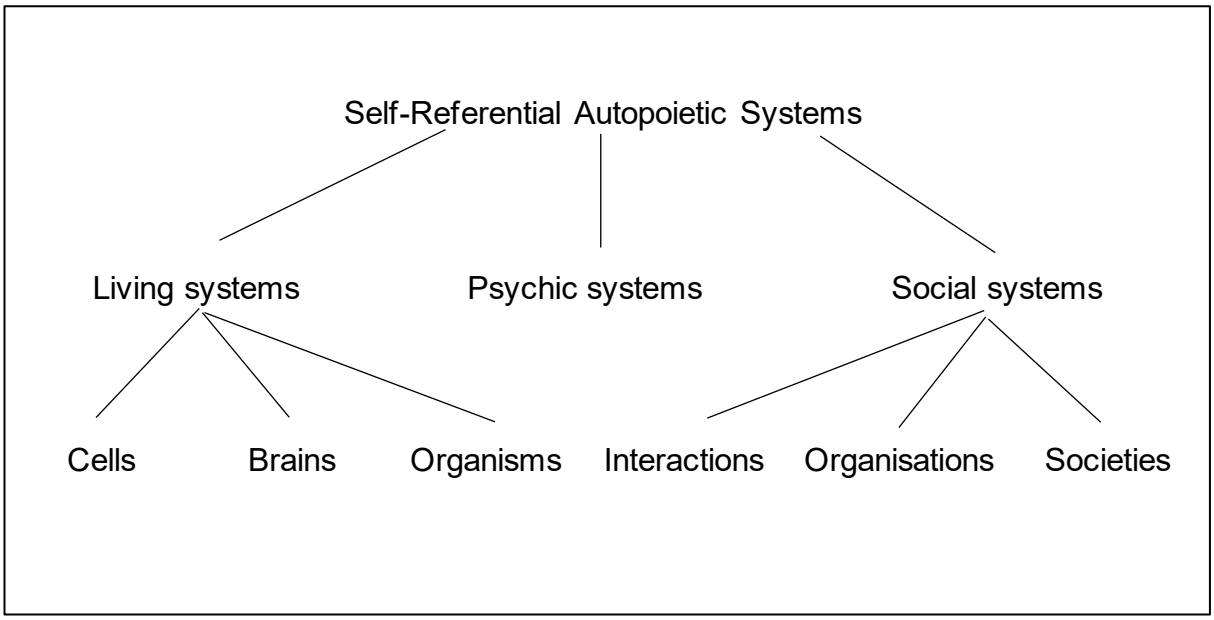


Figure 5-4 A general classification of systems, after Moeller, 2006

All of the system types in Figure 5-4 are all self-referential, autopoietic systems. As such they are capable of self-reference and other reference and, moreover, they are self-producing (more will be said about autopoiesis below).

Perhaps the most striking and counterintuitive aspect of Luhmann's classification of systems, as illustrated by Moeller (2006), is that each of the three main systems listed in the middle tier of Figure 5-4 - living, psychic, and social systems - are environments for one another. This means that there is no containment of one system by another, as is often assumed when we speak of human beings being part of society for example, being part of the social fabric of life. Bodily human beings and brains are not part of social systems but exist in the environment of such systems. The reason for this is "the manner" in which each type of system re-produces itself (Luhmann, 2013). Each type of system has its own specific mode of "operation" (Luhmann, 2013 p. 64; Seidl and Becker, 2006). A system draws its own boundaries through its specific mode of (internal) operation. For living systems, the mode of operation is biochemical, for psychic systems it is the thoughts and feelings of consciousness, and for social systems the mode of operation is *communication* (Luhmann, 2013; Borch, 2011). This leads to the concept of "operational closure". Only the system's operations can produce further operations. These occur 'within' the system and not in the environment, for to do so would "undermine" the very distinction between system and environment. But

operational closure does not mean that systems are completely closed off or sealed from their environments. A system's openness to its environment is predicated upon the system's closure, and more specifically the system's *structure* at a point in *time*. So, the system is operationally closed but at the same time reliant on its environment for structurally determined inputs. Luhmann puts it as follows:

> "Operational closure means only that the system can operate only in the context of its own operations and in so doing has to rely on structures generated by these very operations. In this sense we can speak of self-organisation or, as far as operations are concerned, of structural determinedness" (Luhmann, 2018 p.33)

The relation between a system and its environment is one of "structural coupling" (Maturana & Varela (1982) quoted in Luhmann, 2018 p.328). There exists therefore a form of 'openness' to other systems and to the environment, but this is always determined by the observing system's *structure* which changes through time. *Structure* is vital because the system sets "expectations" through its structural status. (Borch, 2011, p. 24). This delimits the seemingly boundless possibilities (that were referred to above), and therefore reduces complexity, and finally contributes to the autopoiesis of the system. The concept of structure receives more attention in the next section on autopoiesis.

Luhmann has only limited interest in psychic and living systems, save for the importance they play in the materiality of conditions required for the production and re-production of social systems. Luhmann's interest after all is as a sociologist. Social phenomena emerge as a result of interaction systems, organisations, and the societal system (see the lower right-hand branch of Figure 5-4). These system types all use *communication* as a means of separating and (re)producing themselves as systems, and more will be said about the concept of communication below. All of these systems are potentially relevant to interventions using systemic PSM, but because the latter is invariably carried out within the context of organisations it is organisations-as-systems that are most relevant. This is not to say that society as an overarching social system, or "interactions" as short-lived social systems are not useful

avenues for management research. Several researchers have found these fertile grounds for interpretation and understanding (see, for example, Roth et al, 2017; Kieser & Wellstein, 2008; and Mohe & Seidl (2011)).

How can society be constituted as a system? Following the logic so far, a "*single specific* mode of operation" must be identified (Seidl & Becker, 2006, p.17 emphasis as in original). This has already been established (above) as *communication*. And to underscore this point Seidl & Becker (2006) apply Spencer-Brown's (1969) notation for the law of form to this idea. The distinction 'communication/everything else' makes communication the marked space and 'everything else' is disregarded (see Figure 5-5). This is how society differentiates itself from everything else.

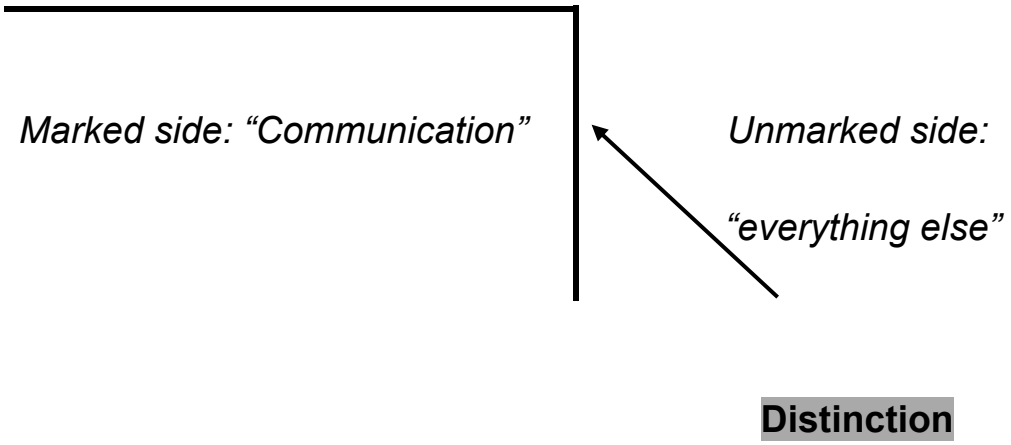


Figure 5-5 Using Laws of Form to mark communication (adapted from Seidl & Becker, 2006)

Society therefore comprises of all communications and nothing else. This includes face-to-face communications, written communications, gestures etc. Of course, society requires physical beings with minds that are capable of speech and writing to help it to continue its autopoiesis, but these are in the environment of society and are not part of it. Only communications and specifically communicative events can be part of society.

What is the gain from this section's understanding of the classification of systems for systemic PSM? If openness is a condition of the system's *structure*, then it becomes important to know something about that structure and how it changes. It might provide some insight into how receptive the system (organisation) is to new management ideas – like systemic PSM - or whether, knowing something about the system's structure, it will repudiate those ideas.

Structure, in this context, does not refer to the reporting lines, levels and hierarchies typically used to describe organisations. It means that particular communicative structure which undergoes continuous change through communicative events. The other potential gain – for interpretive possibility - is to begin to understand the diversity of systems that are capable of making distinctions together with the concomitant implications for, or questions about, coordination or integration. An intervention using systemic PSM is most likely classified as a temporary *interaction* system, which becomes, for at least the duration of the intervention, a feature of the client *organisation's* environment. One might also say, using Luhmann's language, that the client organisation 'opens' itself up *because of* its operational closure to the "irritations" provoked by an interaction system in its environment. This provides a further spur in which to analyse and interpret the case studies and develop theory on the likely take-up or otherwise of systemic-PSM. But first Luhmann's general ideas about autopoiesis need to be set out. This builds on the concept of operational closure and further explains why systems cannot overlap, but it also helps to illustrate the self-producing aspects of Luhmann's theory.

5.3.5. Autopoiesis - communications as elements of social systems

The term autopoiesis was introduced by the biologists Maturana and Varela in the 1970s (Capra & Luisi, 2014). Derived from ancient Greek and meaning "self-making" (Capra & Luisi, 2014; Jackson, 2019), Maturana & Varela's purpose in coining the term was to explain a theory of life at the level of a living organism. They concluded that living things are pre-occupied with their own self-maintenance, their own continued existence, which is sustained by producing the necessary networks of components for existence (in this case chemical molecules) from the very networks of components they are composed of. This circular logic resulted in a number of conceptual developments as witnessed in the previous section – concepts like structure, organisation, structural determinedness, invariant organisation, operation etc. For some time, the application of these concepts in the organisational domain remained metaphorical and analogical (Morgan, 2006), and continue to be employed in this way (Paucar-Caceres & Jerardino-Wiesenborn, 2020; Reynolds, 2005)). Luhmann's achievement is to "generalise" the theory of autopoiesis and to make it "transdisciplinary" (Seidl & Becker, 2006 p.15; Luhmann, 2018, p.32) by

specifying – as above - the single mode of operation that allows each system type to form and maintain a separate existence. Once this is established the theory can be applied to different system types and can "guide" and re-shape our understanding and knowledge of those system types. The destination is to better understand *organisation* (Luhmann, 2018, p.40).

One way of illustrating autopoiesis is to follow Achterbergh & Vriens' (2010b) commentary on Luhmann's work (Achterbergh & Vriens, 2010b, p113 – 163). They use the term "elements" to show how a system's structure can change through time and how this structure connects to potential new elements (see Figure 5-6).

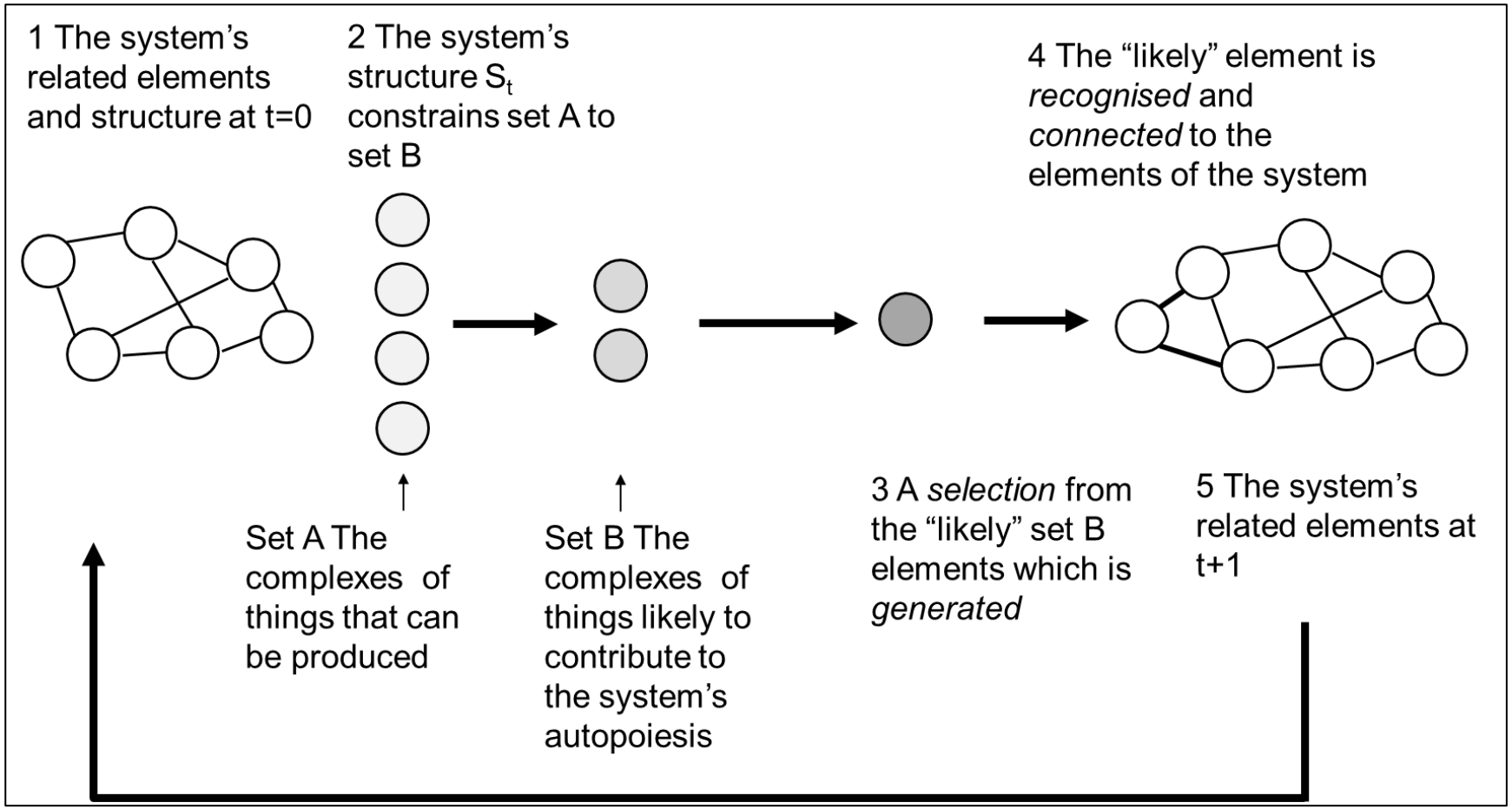


Figure 5-6 Production of elements from elements (adapted from Achterbergh & Vriens, 2010b)

Figure 5-6 illustrates two important aspects of autopoiesis. First, in its ongoing production as a unity (or system), it can be thought of as comprising an unspecified number of related elements and is capable of producing "complexes of things" (Achterbergh & Vriens, 2010b) that might add to, or simply replace, existing elements (Figure 5-6 shows an addition). This capability is governed or regulated by the *structure* of the system at a particular moment in time. The given system's *capability* for re-producing itself is not entirely its own achievement, however. The system's environment provides the "causes necessary for re-production" (Seidl & Mormann, 2015), for example "psychic systems" are essential for the continuation of social systems. But whilst this "materiality" is essential, it should not detract from the radical autonomy implied by Figure 5-6. Secondly, the ongoing production of related elements by related elements is of necessity *selective,* and the criterion for selection is the continuing autopoiesis of the system. Achterbergh and Vriens (2010b, p.120) explain this selection process using Ashby's (1957) ideas about variety, making comparisons about the relative number of "complexes of things" that a given system can possibly produce, given as $V_{possible}$, and V_{likely}, being a subset of elements that is likely to "keep the autopoietic process going" (Achterbergh and Vriens, 2010b, p.120). Thus:

$$V_{likely} < V_{possible}$$

The idea of selection recognises the earlier comment in section 5.3.3 about the reduction of complexity. Selection is necessary to constrain complexity and is determined by the structure of the system. Achterbergh & Vriens (2010b) provide few details about the magnitude of these varieties, but the implications are easily inferred by stating that $V_{possible}$ is substantially greater than V_{likely}. Social systems develop "expectations about expectations", and Achterbergh & Vriens (2010b) illustrate this with their example of an interaction system in a shop situation. Both the customer and sales person in the shop have developed expectations about what each other's expectations are of them, and about what is 'normally' expected in a shopping situation and the likely set of communications that will produce further communications. Communicative events that are not consistent with the communicative structure of expectations will be short-lived and can be marked as "deviant" (Achterbergh & Vriens, 2010b, p.133). Here, communication can become reflexive (Luhmann, 1995,

p.44); there is communication about appropriate communication. This may have the effect of reinforcing expectations about expectations (Achterbergh & Vriens, 2010b).

5.3.5.1. What is communication?

So far, much has been assumed about communication without explaining what Luhmann means by it. As one might expect, he avoids conventional explanations. He criticises the metaphor of “transmission” which suggests that a sender passes “something” - a message or information - to a receiver, and that this “something” is the same for both sender and receiver. Instead, communication must be understood as a three-part selection. First, something must always be communicated – the ‘what’ of the communication, the “information” selected from a “repertoire of possibilities” (Luhmann, 1995, p.140). Secondly, there is the how and why of the communication, or the “behaviour which expresses” the communication, intentionally or unintentionally, which is termed the “utterance”. This includes the medium (email, face-to-face etc.) and the reason for the communication. Both of these components are entirely consistent with the theory of distinction outlined above. The ‘information’ is a selection from all the information that could have been communicated; the medium and reason for the communication is a selection from all the possible media and possible reasons for communication. The third component, called “understanding”, makes a distinction between information and utterance. Here “understanding” has a “technical” sense and should not be interpreted as comprehension; the theory allows for misunderstandings (miscomprehension) which are of course counted as communications too (Achterbergh & Vriens, 2010a), but in the normal sense of misunderstanding are likely “repaired” in ensuing conversations. To distinguish the technical concept of “understanding”, the term is enclosed in quotes, a convention adopted by Achterbergh & Vriens (2010b). “Understanding”, as the third component, follows the logic of autopoiesis because it “materializes” in the *response* to the first communication and thereby is connected to it, and in turn will be connected to a future communicative event, a response to the response, which materializes a new “understanding” ready for future communicative events. In this way “communication communicates” according to Luhmann (2002, p. 169).

“Understanding” is a precondition for the autopoiesis of the system. An example may help: A man, known for his casual dress, turns up for work one day wearing a smart new suit and tie. A colleague says, “so where’s the interview?”. The information is somewhat unclear from the (unintentional) utterance of dressing differently, but the gap is filled in by the colleague. The information in this case may be that something is special about the day for the man to choose to dress differently. The “understanding” is supplied by the colleague. It is the *response* that determines the “understanding” of the initial communication and not the originator. Had the colleague said: “you look smart today” a different “understanding” materializes, but the key for Luhmann is that the response determines the “understanding”. And the *response* to the colleague’s utterance will in turn determine the “understanding” of her communication. Luhmann’s point is that neither interlocutor has complete control over communication, it becomes an autonomous emergent phenomenon (Cooren & Seidl, 2020). Nor does it matter *to communication*, what the respective individuals are thinking. The man may be thinking that his colleague is unoriginal or too easily interested in idle gossip, but because this “understanding” does not materialize in communication it does not exist in the communicative domain, it is not “talked into being” (Heritage, 2011 quoted in Cooren & Seidl, 2020).

What is the gain from understanding Luhmann’s theory of autopoietic systems? The general theory of autopoiesis buttresses other lines of Luhmann’s theoretical architecture. On the one hand it supports the ideas of selection and distinction to reduce complexity, as was discussed above. But it also permits researchers to conceive social systems as highly independent autopoietic meaning-processing systems which comprise of communicative events that come into being and then disintegrate. Such systems are of course dependent on human consciousness to provide vital inputs (utterances); there is no communication without human beings. But social systems have a measure of independence or autonomy that may potentially thwart efforts to change them. (Mohe &Seidl, 2011). This has to be a theory of interest for researchers who are concerned with understanding the take-up or rejection of new management ideas, technologies or (in this case) systemic PSM. On the one hand, systems create structure (anticipation of anticipation) which means they can be highly specialised and create what Luhmann calls “secondary complexity”, and on the

other hand, a system needs to communicate “differences that make a difference” (Bateson, 1972, p.272) so that it may continue to communicate and avoid a state of entropy (Luhmann, 2018, p.102). It will become apparent in the next section, that Luhmann considers organisations to be autopoietic social systems and organisations as specific social systems achieve this through a single specific mode of operation. It is employed by all organisations, and Luhmann refers to it as the “communication of decisions”.

5.3.6. Organisations and decisions

The discussion has now come full circle. Autopoiesis, operational closure, structure, communications as event-type elements, connectivity, and the three-part synthesis of information, utterance and understanding in communication have all been briefly explained. All are vital aspects of Luhmann’s general theory, all necessary in getting to this point. The discussion now goes back to organisations, seeking to explain their intrinsic logic using these ideas. Luhmann’s theory is neither normative nor empirical. He believes that organisations constitute themselves through the communication of decisions.

5.3.6.1. Decisions

An organisation looks into its future. Its accounting officers (appointed by a past decision) have done some forecasting which predicts a likely deficit in two years’ time. The response is to announce a cost cutting drive and a revenue generating programme (decision communications). These decisions then become premises for future decisions. Managers respond by reducing services (decision), productivity drives are announced (decision), resources are shifted (decision) to persuade customers to continue their custom. This typical pattern of decision making is familiar in all organisations be they universities, charities, or enterprises, and this type of decision logic is at the heart of Luhmann’s theory. So how do decision communications differ from other communications? What is so special about decision communication?

In everyday circumstances individuals make choices, deciding to do one thing rather than another. These choices are mental events, sometimes made consciously, at other times unconsciously. For example, a man “chooses” to leave his makeshift study to avoid the tedium of trying to understand Luhmann’s

works and immediately begins to do a different activity. No social agreement is necessarily required in this case. As Luhmann argues:

> "In the normal course of events, there is not enough time, nor is it so important, to record decisions in a socially visible fashion or to make it clear when a decision is made, on what subject and over what other options, and why one behaviour is preferred to another". (Luhmann, 2018, p.44)

On the other hand, if a manager communicates to her department that redundancies will be made, she at once communicates (1) that a "selection" has been made, (2) that this selection has been made from a set of "selectable options", and (3) that the other options were not selected (Achterbergh & Vriens, 2010a). Luhmann calls this a "complex" communication (Luhmann, 2018, p.44). The communication of decisions is on the one hand "risky", because when "understanding" occurs via the (social) response to the original communication, the originator should have explanations (through anticipation) "at the ready" (Luhmann, 2018, p.99). And on the other hand, decision communication is an absolute necessity for the organisation's continued operations:

> "When an organization comes into being, a recursive decision-making network comes into being. Everything that happens at all happens as the communication of decisions or with regard to this communication." (Luhmann, 2018, p.45)

There can of course be other behaviour in organisations – for example, idle talk, socialising etc. (the stuff of *interaction* systems) – but this behaviour would not exist if the communication of decisions did not occur (Luhmann, 2018, p. 45). It is the latter that is constitutive of organisations.

Decision communication is special because it communicates what has been decided and what has been forgone. It contains a form of auto-critique because it makes implied references to alternatives that were considered but not chosen. Luhmann considers this a paradox (Luhmann, 2018, p. 98-117; Cooren & Seidl, 2020, p.11) in that a selection (preferred alternative) has been made from alternatives that were not chosen, but all the same are "real" alternatives. At the

same time, the alternatives are not "'real' alternatives otherwise the selected alternative would not be accepted as already decided." (Cooren & Seidl, 2020, p.11). The main consequence of this paradox is that decisions are fragile communications and can be challenged or "deconstructed" (Luhmann, 2018, p.111). If decisions are contested, then this can threaten the autopoiesis of organisation. Ensuing decisions can no longer connect to the communicated decision and the risk is that this leads to a permanent conflict (Luhmann, 2018, p.111).

How seriously Luhmann considers this threat to autopoiesis is a matter of debate. Heinz Von Foerster famously remarked that "only those questions that are in principle undecidable we can decide" (von Foerster, 2003, p.5). What he meant by this is that only decisions that are incalculable can be decided. To decide such questions involves a "leap of faith", there is risk and a "rationality deficit". But even if the communication communicates the selected alternative and merely a glimpse of what was not chosen (effectively the side that may create doubt), it still creates information for the system, which the system can then process to stimulate further information processing. Uncertainty is therefore two-sided and cannot be "organised away"; it is a necessary condition to prevent the system going into a state of inertia or entropy.

In any case, the risk of permanent conflict can be avoided according to Luhmann because of the *structure* of the system (in the sense meant by the theory of autopoiesis). For organisations, this is a relatively stable set of "undisputed decision premises" (Achterbergh & Vriens, 2010a). These decision premises have a high probability of acceptance and they tend to "safeguard" the generation, recognition, and connection of decisions to previous decisions. An example would be a university that decides to adopt a common IT eco-system or platform (for example, Microsoft). Future decisions would look to this decision as a "normative point of reference" (Achterbergh & Vriens, 2010a). The premise serves two functions. First, an ensuing decision - to buy Microsoft products – is legitimated by recourse to the earlier decision, Luhmann, speaks of "dependence" or "loose coupling"; and secondly, assuming that the decision premise is uncontested, it helps to save decision costs (Luhmann, 2018 p.181).

Luhmann appropriates March & Simon's (1976) concept of "uncertainty absorption" to describe the succession of decisions (Luhmann, 2018, p.148). A decision for *this* rather than *that* creates confidence and acceptable levels of certainty for organisational members. Decisions taken and not taken become part of the system memory; they can emerge as "topics", left free for "reselection". This part of his theory - a consequence of autopoiesis – deserves some amplification, as Luhmann links it to various findings in the organisation theory literature, for example Nutt (1984), who reports managers' reluctance to support normative-rational decision-making processes; instead, these managers consider alternatives that are easy to accept or reject; certainty is "pretended", "fictions" help to create an illusion of control (Luhmann, 2018, p.150). But at the same time Luhmann argues that uncertainty absorption is not just about reducing uncertainty. A system can develop "secondary complexity" as a result of its operational closure, because it decides on "decision premises for further decision" and, as above, they tend to be uncontested. If they are uncontested, this reduces the burden or cost of decision making, and future decisions can be observed in terms of their conformism to, or deviance from, decision premises. Decision premises are wide ranging and are summarised in Table 5-4 below.

Decision Premise	**Explanation**
Membership	Membership of an organisation is determined by *decision.* Membership commences by decision (appointment) and ceases by decision (dismissal/acceptance of resignation). Decision communication with those outside the organisation (non-members) does not "count", whereas decision communication with someone whom one knows to be a member is more likely to "count". Membership also has the effect of "binding" individuals to decisions made in the organisation. Decisions can be contested (as above), but if one wishes to continue membership one has to abide by some of the decisions.
Communication Pathways	Communication pathways are premises for how decisions should be taken. They are equivalent to Brunsson & Brunsson's (2017) "logic of appropriateness". They specify who (or which "position" – see below) should be involved in

Decision Premise	Explanation
	each stage of decision. Most of us experience this decision premise as “hierarchy” and label it as such. But “pathway” seems to be more fitting because it does not always imply levels. Pathways may be determined in advance of actual decision making, for example in preparation for crisis situations.
Decision programmes	Decision programmes come in two forms: (1) Goal Programmes (2) Conditional Programmes. Goal programmes specify what desired effects – e.g., in a university teaching must be engaging – leaving it open as to the choice of means. Goal programmes underpin much of the machine-like thinking that is assumed to be the ‘common-sense’ way of thinking about organisation phenomena. But interestingly, Luhmann does not give primacy to this or any other decision premise. Any perceived primacy will be the result of ongoing communications, communications about decisions. The lack of a central point or apex is advantageous to the system’s secondary complexity. Conditional programmes establish a specific situation or pre-designed threshold. When the threshold is reached a “decision” occurs. Luhmann cites simple examples in inventory situations where stock falls to a re-order point level and replenishment orders are made. Conditional programmes significantly reduce complexity and at the same time create certainty for members of the organisation.
Personnel (expertise)	Personnel – individuals who have been assigned to roles, have been trained, have professional outlook etc – and help to establish expectations about expectations. If one knows the profession and expertise of another one can form expectations about what decisions will be about. The other too can form expectations about expectations.
Position	Positions are understood as “decision junctions” and not as occupations or roles. The concept implies a coming together of various decision premises, for example a decision programme, communication pathway and a member of personnel (expertise) which significantly determines the regulation of what is possible and *probable* in terms of likely decisions.
Planning	Planning also has an integrative effect. Organisations are not sequential machines and so decisions have to be coordinated. These premises are called “planning”, they regulate the production of “synchronic” and “diachronic” decisions. Planning too does not assume a ‘central’ place

Decision Premise	Explanation
	but all the same is recognised as a decision premise that has some function in regulating decisions.
Self-Descriptions	Self-descriptions are also classed as a form of decision premise, and like "planning" and "position" attempt to have some integrative effect. The organisation uses the system/environment distinction to describe the "identity" of the organisation. Self-descriptions function like a form of reflection and together with "planning" and "position" create "decision premises needed for changing decision premises" (Achterbergh & Vriens, 2010a, p. 150)
Undecided decision premises	Some decision premises, according to Luhmann, are *not* the direct results of decisions. Under this heading Luhmann considers "organisational culture" and "cognitive routines". Organisational culture refers to Handy's (1993) definition of culture "as the way things are done around here". Its occurrence as an undecided decision premise is largely explained by an overlap with organisation communications with societal communications (values etc.). Their function is to structure decisions when explicit decision premises are unavailable. Checkland & Scholes (1990) provide a good example in one of their applications of SSM where some of the people in in the organisation "know Tom" (KTs) and some "do not know Tom" (NKT). This may affect what counts as a decision and also may become a point of reference for future decisions. Cognitive routines emerge from practice. An example might be who to use as a supplier or the way university lecturers view students. They are ways of seeing, mental models. They are undecided decision premises because the emerge in day-to-day practice, are frequently reinforced and largely unconscious. They are difficult to remove by means of explicit decisions.

Table 5-4 Decision Premises (Adapted from Achtebergh & Vriens, 2010b)

Luhmann's theory has now met his two fundamental conditions which permit him to claim that forms of organised complexity (organisations) have emerged which (1) use communication about decisions as their single specific mode of operation, and (2) that this communication creates a relatively stable set of decision premises (elements) which regulate the ongoing production of decisions. The result is an organisation form that is operationally closed but open to self-generated irritation according to the state of its structure. The next section considers how these ideas can be taken advantage of to provide further interpretation of the cases.

5.4. Re-interpreting the cases through Luhmann's complex social systems theory

There can be little doubt that Luhmann's theory of social systems and theory of organisation is highly abstract. As a sociologist, he had a much broader canvas on which to pitch his ideas. His aim was to account for advanced forms of social (organised) complexity, how it evolves, and how it is constituted. His theory explains 'how things are' and not 'how they could be'. But the theory does have *practical* implications, and even Luhmann (2018, p.vi) considers its potential influence on policy but without making this clear. Section 5.4 attempts to appropriate some of the ideas from Luhmann's work so that they may guide further interpretation of the cases. It does so by attempting to re-construct the dominant decision logic in each of the cases, so far as this is possible; acknowledging that this is an external description of the organisations involved in the cases.

Luhmann's ideas are mobilised to ask a number of questions about each case as follows:

1. What is the dominant decision logic in the case?
2. What decisions appear to be relatively "undisputed" and therefore stable reference points for future decisions?
3. Conversely, what decisions (if any) appear to be "fragile"?
4. What evidence is there (if any) of the decision premises to change decision premises (e.g., self-descriptions)? How are these judged by the organisation?
5. To what extent did the intervention cause decision premises to change?

Each of the case studies is now discussed in turn.

5.4.1. CC

Users of systemic PSM are trained to think about *problem contexts* first, and organisations second. If the *problem context* takes precedence, then users may assume – as I did at the outset of this intervention – that applications in larger

organisations, with constitutional responsibilities to consult and engage with a wide-range of stakeholders, are domains where it is more *likely* that systemic enquiring methods will be taken up. However, the grounds for believing this recede if focus is switched to the underlying decision logic of the organisation and not its perceived problems.

As a local authority CC is a highly sophisticated organisation and has evolved uncountable decision premises that create expectations about expectations. The Housing and Regeneration Service is effectively the “communication pathway” for which potential regeneration or improvement projects are channelled. The approved project/potential project distinction plays a major part in generating, recognising, and connecting new decision communications. Established projects, for example, have agreed terms, they are resourced, reported and “signed off”. Once approved, the organisation can ‘ignore’ them to some extent because they become “stable points of reference” and can be connected to future decision-making. For example, as projects they are monitored, and can go off track, become more expensive etc. Their openness to the future is in this sense governed by expectations about what effective project management is. Personnel (expertise), decision programmes, membership etc. are all structural features of the situation reducing complexity but offering some ‘openness’ to manage risk and take advantage of opportunities. For those would-be-projects, the ones yet to be formally approved, the ones that are part of the ‘project jostle’, these are communicated as decisions for the Housing and Regeneration Service to investigate. Meetings are held to discuss the potential projects. Invites are made and undecided decision premises – culture, cognitive routine – may influence who is invited, and where the meeting is held. All of these are *decisions* of course, and the location may be important if external invites are made. In the initial workshop there was an element of surprise communicated by participants, there was some disbelief that the area under investigation, known as area A, was actually under consideration as a potential project. Later, some of the reasoning behind this became a little clearer as the client revealed that two councillors were engaged in a struggle over resources. One councillor was intent on “cluttering” the project list, the other intent on “decluttering” the list, to free up financial resources for a much bigger project.

These motives were only communicated to the researcher once the intervention was over. Motives may well be perceived by participants during interventions, but one can never be entirely sure of another's motives. Even if they are communicated – in the sense of being attributed to someone – tact has to be used in determining whom motives can be communicated to (Luhmann, 2018, p. 71). Sophisticated social communication has emerged which can avoid the explicit communication of information that is unmentionable. And these motives – which were part of the problem situation – had to remain as unmentionable. No one seriously assumes that systemic PSM is carried out in a transparent, unscripted world, but to assume that this poses no problems in its application, and that it has some kind of equivalence to the organisation's information processing capability is highly questionable. Only the organisation's own information processing resources possess the capability to understand such subtleties. In the client's words, "it's just far too subtle" (XX, interviewee, case CC).

The client's observation that projects "are being chucked in", may for some mean that there is even less time for systematic analysis. But the 'real' motive for "chucking them in" is so they can easily be cast aside or blocked, serving only to provide support for a different proposal, and creating a continuous restlessness in the system, to makes decisions so that these may be connected to future decisions (see Nutt, 1984 quoted in Luhmann, 2018 for the practice of creating options that are easy to accept/reject).

During the intervention there was little evidence to suggest that any of the detectable decision premises were being challenged. The main form of self-description that the client referred to was the "deep thought sessions" referred to in chapter 4. These are an opportunity for the organisation to reflect and to assess whether "we are happy with the things we are focusing on" (Interview XX). The sessions result in "minor modifications, not "wholesale change", the inference being that the organisation is not dissatisfied with its means of self-description. Finally, there is little doubt that the outcome of the intervention affected CC's decision premises in at best a modest way. The main outcomes from the intervention were documented in chapter 4.

5.4.2. GMC

Of all the four cases the GMC case permitted more access to the organisation's decision logic than in any other case. The very existence of the organisation in its current form became the object of discussion at the board meeting I attended as a non-participant observer. In the language of Luhmann's complex social systems theory the organisation was hyper-sensitised to its constructed environment at the time of the intervention. Again, as in the CC case, one might expect that the context provided significant potential to use systemic-PSM to manage the uncertainties, to create better understandings about the purpose of the charity among its members and stakeholders. But the timing of the intervention seemed to work against the prospect of success. The client needed to prepare the board to discuss and endorse a new decision programme for the charity in just 3 weeks. All problem-solving approaches of course have to work under time pressure and the GMC case was a valuable illustration of how systemic-PSM can be tested in these conditions. Methods were quickly adapted to the situation, as described in chapter 4.

Under the pressure of time Luhmann asserts that "easily obtainable information is favoured over information that is harder to come by" (Luhmann, 2018, p.138), and this mirrors what happened in the case. The CEO wrote urgent emails to trusted confidants (the size of the charity almost dictated that external description was one of the only reliable ways of generating information) seeking considered, but hard-headed, opinions on the organisation. Comments were collated and reported to the trustees (with explanatory commentary). The deputy CEO worked with the researcher to compile a rough and ready SODA map of opinions and beliefs solicited from trustees, and in the background the client and researcher worked on some soft systems models and comparison tables. But urgency got the better of patience, and when the models and comparison tables started to repeat and re-examine issues that were already known to the client, confidence in the methods began to wane. The ability of outsiders (in this case the researcher) to manage both *process* and *content* issues, and avoid, if at all possible, any repetition was fundamental, especially where time is perceived as scarce. Of course, one also has to observe – following complex social systems theory – that numerous decisions need to be coordinated and this is the job of the decision premise called "planning" (see

table above). *Deadlines* help to serve the coordination of multiple decisions. The client acknowledged (in the post-intervention review) that availability or recency bias was a characteristic of how the sector operated. Because the sector works with the latest technology to transform the way we travel, it will always have something of the *zeitgeist* about it. But if “planning” attempts to coordinate decision making through the use of deadlines, “existing information processing” will count more (Luhmann 2018, p.139) and attempts to reframe situations or perform a bigger picture analysis will be avoided, perhaps even resisted. When urgency trumps careful, patient and considered forms of problem management, “sweeping-in” various stakeholder views, observers may likely see a deficit of “correct” problem structuring, or “thrashing around” (Checkland, 1981) or reductionism-in-action, but such observations too easily overlook the decision logic of the organisation.

Several decision premises are considered to be fragile. The major source of concern was the decision programme. The charity had been involved in car-sharing since its inception. Its identity (self-description) was now being questioned by other organisations in the sector and by one of the trustees who compared the goal programme to the charity’s declared purpose in its articles. He argued that the charity had met its objective and should therefore cease its car sharing operations. But in the end the organisation made a decision to continue its work in car sharing, create a new brand, and anticipate further decisions about a new CEO. These decisions were attributed to the board. Any notion that the charity would become a “tiny charity with one filing cabinet in an office”, or a “regulator”, or a “campaigning organisation” were made into decision alternatives, ‘available for selection at another time’. But even though they communicated the possibilities for “deconstruction”, the charity appeared to reorient itself around its new goal programme and its decision to do so quickly resulted in decisions to re-brand, to approve the re-brand, to communicate the new brand etc.

Other decision premises – including premises to change premises - appeared to be functional and seemed largely uncontested. The board as “communication pathway” was tested and was deemed to offer support to the executive officers. And the planning function as discussed above seemed to function. Did the intervention help to change or have any impact on the perceived decision

premises? The answer is highly unlikely. The aims of the intervention were considerably reduced because of the time factors and the availability of relevant stakeholders.

Given the uncertainty facing the client at the time of the intervention and the constraints on time, one has to seriously question whether more descriptions (coordinated from the outside, by the researcher or a would-be interventionist using soft systems ideas) would be welcome at this point in time. No description or reflection, regardless of where it comes from, would ever eliminate the uncertainty (notwithstanding efforts by some management consultants to confirm client beliefs and to frame problems in such a way as to reduce anxiety – see Clark, 1995; Sturdy 1997, cited in Heusinkveld, 2013). According to Luhmann's theory, forms of uncertainty are exchanged for others as the system reorients its levels of "irritation". The uncertainty is transformed but is never eliminated. There may well have been more systems work done (if the intervention had been triggered earlier) but one has to consider whether the organisation's own resources for self-observation and self-description are good enough. Arguably the case organisation is more than able to use its own milieu knowledge to enhance its decision-making capacity.

5.4.3. Canon Valve

The single most important decision in the Canon Valve case was communicated by the group in [redacted] It effectively reasserted the command that Canon Valve remain in 'turnaround' mode, minimise losses, and maintain high quality with zero product claims. Ensuing decisions taken at a more local level by JJ and his team were highly consistent with this decision premise. There were quality investigations, additional training for operators and efforts to find tenants for the site to improve income. Even if the decision to close the foundry was informed by bogus information or false reasoning – to the disapproval of the client - it was still consistent with the original decision premise of being in 'turnaround' mode, because its closure would contain costs and create focus on the core operations. There were at least two episodes when this decision was discussed with the researcher. First, and as a direct result of SSM modelling, I asked the client how he gauged or tested the group's appetite for investment. The client used informal, off-the-record chats with the CEO in [redacted]o take soundings.

He would be listened to, “politely”. But the reply was to enforce the original decision and to force down any perceived resistance to the goal programme that had been established by the original decision. On a second occasion at a board meeting, JJ would announce that he was working with me (the researcher) on some ideas about investment planning. The reported reply was: “That’s fine JJ, good for you, but….”. The reported response implies that there is *no* decision to investigate new investment, there is no authority. Again, the original decision is reinforced, and any perceived contestation is rebutted. This may explain JJ’s tendency to talk about fate and destiny. One might conclude then that decision premises were relatively undisputed at least communicatively. The ambitions that JJ had for Canon Valve were laudable, but at this time did not enter any decision logic constitutive of the organisation.

Did the intervention have any influence on decision premises? JJ acknowledged that the process reminded him of “things” that he was not doing, “things” that he had forgotten or neglected. For example, he had ceased to question the parent organisation’s rationale for assigning orders to companies within the group, he had neglected the small things that might create marginally more favourable conditions for his plant. Conceptually, at this point, we are in difficult terrain. The argument is expressed in terms of cognition. In Luhmann’s complex social systems theory we have two “inter-penetrating” psychic systems. But the implied “understanding” and consequences for decision are displayed in communication. The acknowledgement that “remembered” aspects of the situation could trigger further communicated decisions arguably had a negligible impact on the organisation’s existing decision premises.

Of course, memory - and the supposed normal state of affairs, “forgetting” - occupies a central place in Luhmann’s complex social systems theory. The function of forgetting is to free up the system’s capacity for information processing (Luhmann, 2018, p.154). This can be seen to some extent in the client’s attitude to the models, documents and artefacts produced by the intervention – “they are comprehensive, and we can say that we have documented what we know” (JJ interview). But… “I can turn to action [we might insert “decision”] when I need to, preparation is not always necessary.” (JJ interview). Managers seem to know that things will change and therefore see

little point in making records or descriptions that will soon be out of date. Anderson & Pors (2016) put this well, indicating a wider generalisation:

> "There is growing awareness of the fact that the future towards which we strategise will have transformed into something entirely different long before our strategic efforts have been implemented." (Anderson & Pors, 2016, p.18)

From the perspective of complex social systems theory, the Canon Valve case shows how reinforcement of a decision programme occurs. The selected option (just looking after quality and managing costs) becomes the reliable reference point from which to make future decisions to continue the autopoiesis of the system. The 'rejected' alternatives on the other hand (e.g., move the plant/sell the existing site) are ready for "selection at another time" (Luhmann, 2018). They enter the systems memory. Others may well interpret this as a case of "marginalisation" (Midgley, 2000). Without wider access to the [redacted] group (and their self-descriptions), the interpretation rests on less that firm foundations, but one might speculate along with Luhmann (1993) and Harrison & March (1984, quoted in Luhmann, 2018) that "open contingency" is preferred to "closed contingency", the latter giving more cause for "reproach" and "regret" (Luhmann, 2018, p.134). However, land prices might fall, and once-available-sites might become no-longer-available, so even a decision to defer a decision may be a cause for regret, or reproach or both. And this might also explain why the results of systemic-PSM interventions, written down in models and documents, may not always be desirable, because they are more easily accessed by the systems memory.

5.4.4. Romflower

The Romflower case was judged to be more receptive than the other cases, and, perhaps, as a result, was judged to be more effective. Again, the theory of complex social systems is used to provide some guidance on possible interpretations.

The dominant decision logic identified in the case focused on the unique way that this organisation defined projects. In effect the client had created his own management theory which was loosely based on some ideas that were

traceable to leadership coaching and to others that had been popularised by the author Simon Sinek. As described in chapter 4, all project descriptions and specifications would be written in the BE-DO-HAVE format set out by the CEO. Classed as a decision programme but based on a means specification rather than a goal programme, it was less flexible that most examples of this type of decision premise. The decision was highly contested. Criticisms of the approach were made to me (as researcher) by several of the managers. Deadlines (for the specification of projects) were not kept or were missed, potential signs (responses to decision communications) that the decision premise had not been fully accepted. Even the client acknowledged that some of his managers were struggling with the concept and that there was some resistance.

Where a decision premise ceases to become a stable reference point, time might be devoted to challenging it and this may frustrate the production of future decision making. There was a sense that the decision premise (to command a way of describing projects) was over-specified, affording no flexibility to future decision making. The relationship of decision premises to future decisions is one of “loose coupling” (Luhmann, 2018, p.181). If time is spent re-visiting a decision premise, to question it, then it no longer serves its purpose of uncertainty absorption and increases the overall cost of decision. Luhmann suggests that when decision premises are contested repeatedly, they may result in seemingly interminable conflict. There is something pathological about contested decision premises that endure for longer than is necessary.

Other decision premises operated in a reverse fashion, providing solid reference points, and even helping to facilitate the intervention, not least the fact that the intervention had been approved by the client who was both CEO and founder owner. This may be self-evident but is supported in the literature with Ackermann et al (2020) urging users of PSM to encourage the most senior *decision maker* to attend workshops (Ackermann et al, 2020, p.9). Rutter (H. Rutter, Personal communication, June 2018)) has also confirmed the need to engage the most senior people to commission systems work. After building some confidence about me (the researcher) on the first day of the intervention, the client decided that I may come go to the offices as I pleased – a form of *quasi-membership*. The management team also assented to this. Good levels of trust were built up. Others have conceptualised this kind of situation, in line

with complex social systems theory, as a consultant organisation, client organisation, and contact system with “idiosyncratic communication processes” and degrees of structural coupling (Mohe & Seidl, 2011, p.29). In order to help with communication, the models produced (as much as they could be) were explained in the terms that the CEO used to describe projects. This also may have helped to influence the organisation’s self-descriptions, important fora to decide changes to decision premises. The organisation used weekly team meetings – comprising all heads of departments and the CEO – as a means of reflection and “self-description”. The models and rich pictures (ostensibly external descriptions) were used in these meetings as a means to create discussion and learning.

To what extent did the intervention change the decision premises of the organisation? The main outcome described in chapter 4 was that an agreement was reached on the roll out of the project specification programme together with agreement to reschedule some deadlines and better appreciate the balance of the “business-as-usual work” to new project work. Again, these were modest outcomes, but they were directly linked to the pathological decision premises identified earlier. A *decision* was made for managers to list the most important projects and to mutually agree dates for their specification with the CEO. This would connect to a whole series of related decisions. This would not vanquish uncertainty; it would just transform it into a different form of uncertainty. Decision communication is not unlike most theories of problem-solving in this respect. Problems do not disappear entirely, they just create newer problems later on.

The client in this case was highly receptive to the ideas and methods of systemic-PSM. In my first meeting with him he listened carefully about previous applications of the methods and then told me his own ideas about management and what he was trying to do. As mentioned earlier he showed significantly higher curiosity than any other manager or client in any of the case studies. It is suggested that his curiosity, openness, and general willingness to try new ideas may have been triggered by the contested status of one of his key decision premises. By the end of the intervention, he asked me rhetorically “I am the one that needs to change, yeah?”

In the next section some attempt is made to evaluate the complex social systems lens.

5.4.5. Evaluating Luhmann's complex social systems lens

The discussion of Luhmann's work above touches just a fraction of his output. Readers are as equally dumbfounded by his abstraction as they are in awe of his imagination and range. There is no getting away from the fact that Luhmann's work is a difficult read, not least because it challenges conventional ways of thinking. But at the same time, it is highly imaginative and bursting with interpretive possibility and comes with a rich, descriptive language. We have no difficulty imagining a living being as a system with broadly perceptible boundaries like hides, skins or feathers (Luhmann, 2018) but it is difficult to imagine autopoietic systems that comprise of communicative events only. One of his more helpful descriptions is contained in *Social Systems*:

> "One can imagine this [a communication system] as a constant pulsation: with every thematic choice the system expands and contracts, takes up meanings and lets others fall away." (Luhmann, 1995, p.145).

Even so, Mingers (2006) considers such ontological claims questionable. Notwithstanding the interdependencies with human beings, the idea of highly autonomous, operationally closed, meaning processing systems seems somewhat fanciful. Mingers (2006) considers Luhmann's characterisation of organisations as recursive networks of decisions "highly reductionist". But this misses the point. Luhmann recognises all of the societal communications; they are no less important; they are just not constitutive of organisations.

Because of Luhmann's fascination with paradox (a major analytical tactic), he often seems to want it both ways – decision communications are contestable because of their paradoxical form, but they are also relatively stable points of reference for future decisions. Can it be both? Luhmann seems to hedge his bets. As a means of defending his theory of autopoiesis, Luhmann writes:

> “One must experiment with it quite a while in thought in order to see gradually what it yields.” (Luhmann, 2002, p.161)

It emphasises the sociality of intervention – the potential to reorient research in the management systems literature away from problems to an understanding of the sociality of decisions. The theory of operationally closed structurally open systems also explains plurality and the development of secondary complexity. The argument for including Luhmann is to improve the interpretive yield.

5.5. Some implications

The considerations made above lead to a theory that produces a more nuanced understanding of the circumstances in which systemic problem structuring methods might be needed and effectively deployed. Existing theory tends to focus on the problems and problem contexts that managers and organisations face, but this can ignore the inherent decision logic of the organisation in which the intervention is carried out. Since most interventions occur within the context of organisations, understanding something of their decision logic is essential to assess the likely need for systemic PSM and its chances of success.

This way of thinking is very different to the way Critical Systems Thinking (CST) and Soft OR have been established. CSP implores its adopters to imaginatively explore a theoretically diverse set of problem contexts using a set of metaphors. The intention is to match a systems methodology to the situation at hand and to do so critically. Soft OR aims to support the management of particular types of problem. But the discovery, realisation or near manifestation of ideal-type problem contexts in theory or in practice does not automatically *guarantee* that systems-inquiring methods will be taken up. For this reason, there should be little surprise that these methods have not been widely adopted by managers. But surprise there is and also significant expectation about demand. The empirical material observed as part of this thesis and the theory of complex social systems suggests that systemic-PSM is more likely deployed as an *exception* rather than the rule and is likely to be in demand when existing *ways of seeing* (or, more precisely, self-determined irritation) have been exhausted.

5.6. Researcher reflexivity

How much did my own “house style” or “personal consultancy craft” influence these results? How did the version of “sent role” and “received role” (Katz & Kahn, 1978, quoted in Coghlan & Shani, 2006) effect the findings? These are important questions calling for appropriate reflexivity. My influence on the results is unavoidable, given my choice of methodology and the need to address both the action agenda (consultant role) and the research agenda (researcher role). However, referring to chapter 3, I argue that the real test for this type of research is "recoverability". I would hope that reviewers can trace the steps I have taken in order to make some judgement on the overall quality of the research process, and the effect this may have for the findings, e.g.:

- the setting down of the research design and the a priori constructs in Chapter 3;
- the careful selection and justification of case studies in Chapter 3, and their agreement with the sampling criteria established in section 3.4.2.;
- the narrative form of presentation of the case studies, to create a vicarious experience for the reader in Chapter 4.

Despite these advanced declarations and safeguards, lessons can be learned, and I discuss two examples in this section.

I started out with assumptions that the proposed interventions would be well-received and there would be no shortage of requests from case study organisations. This turned out to be a faulty assumption. I made the distinction between consultant and researcher role types in chapter 3 and have referred to these important roles throughout the research. The consultant role is sometimes perceived as a "helping" role (Coghlan & Shani, 2005), and can mean different things depending on the sender, receiver, and other circumstances, such as the media used for communication. The initial written form of invitation to take part in the research may have communicated the *research* role at the expense of the *action* role, which is usually presumed to be of more interest to clients. I concede this may have affected some of the initial recruitment to take part in the research, which might impact some of the results. But as discussed in chapter 3, it soon became apparent that clients were much more interested when they

were secured via referrals from my first line contacts. In these circumstances, I could better control the emphasis on consultant and researcher role types because the meetings were held in-person or by using video conference software. A greater sense of control, with two-way conversation, helped to build trust.

A second lesson learned relates to modelling which was sometimes perceived as by clients as time-consuming, overly technical, and unnecessarily detailed. The experience would make me think carefully about sharing expansive models in the future. There are warnings in the literature (e.g., Checkland & Poulter, 2006), though there are others (e.g., Wilson and Van Haperen, 2015), who make a point of using thorough, extremely detailed, sweeping displays. Diagram fragments are more appropriate for many audiences and there is good reason to let the detailed modelling retreat into the background. Users of systemic PSM tend to see the modelling as convoluted and in danger of repeating too much which is already known, established, or of little interest in the present. Being able to move from a synoptic view to a more focused view, quickly, is a valued aspect of intervention, and for this researcher a lesson hard won. One might wish one was as elegant a modeller as Checkland, Ackermann or Eden; as comprehensive and as quick as Wilson or Van Haperen; and as critically astute as Midgley or Jackson; but, were they to trace my steps, they too may recognise some of the surprises in the findings that I refer to above.

Both these examples of lessons learned take place in the *process* of research and cannot necessarily be anticipated in advance. They are inevitable consequences of intensive style research. I would argue that their impact on the overall findings is negligible.

The main antidote to these kinds of concerns is to maintain a form of scepticism to the findings, be open, reflect on the action, and make efforts to contradict first impressions of the material.. Throughout the process, I spent significant amounts of time writing hand-written notes on contextual factors, emergent theory and reflected on how my approach was shaping the interventions and the resulting empirical material. In summary, the researcher’s effects are inevitable, but adequate traceability and good habits help to provide some assurance.

5.7. Conclusion

This chapter attempts to describe why and how the cases unfolded as they did. The empirical material suggests that on the whole clients are somewhat indifferent to systemic PSM, and that the indifference might be explained by factors including lack of training, preferences for existing problem-solving approaches, a reluctance to model detail, a potential preference for a private form of 'systems thinking' and a lack of confidence that systemic PSM "was going to work". Against this there were reported benefits from all of the interventions, and some were deemed more successful than others. Several of these findings are consistent with the literature. The empirical material could not fully explain a number of anomalies that throw doubt on to existing theory and understanding. Luhmann's theory of complex social systems was introduced as a means of generating further interpretations of the cases, particularly the decision logic of the host organisations. These considerations lead to a theory that potentially produces a more nuanced understanding of the circumstances in which systemic-PSM might be used. Existing theory focuses on the *problems* that managers and organisations face which takes away from the inherent decision logic of an organisation. Only if we can know something of the decision logic of an organisation can we begin to assess the likely need for systemic PSM and its chances of success.

Chapter 6 Discussion

6.1. Introduction

The last chapter provided a reinterpretation of the empirical material by making cross-case comparisons and by using Luhmann's complex social systems theory as a lens to trigger further investigation of specific material. One conclusion from chapter 5 is that systemic PSMs are more likely to be accepted in specific circumstances and rejected or repudiated in others, and that the decision logic of the organization involved in the intervention may have a significant bearing on this. In this chapter I trace through the implications of this reasoning and outline a theory of when systemic problem structuring methods might be needed and effectively deployed. The chapter is divided into 5 sections. Section 6.2 outlines the contributions that this thesis makes to the theory and practice of systemic-PSM. In section 6.3 the nature and character of the contribution is set out. I argue that the contribution is achieved through aspects of problematization *and* neglect spotting, resulting in an incremental contribution to the literature. Section 6.4 turns to a discussion of the implications. Three main insights are described, assumptions in the existing literature are questioned, and the importance of the findings in this thesis are explained. The chapter ends with a short conclusion.

6.2. Contribution to the theory & practice of systemic PSM

This doctoral thesis claims four contributions to the theory and practice of softer and critical forms of systems thinking and Soft OR (what I have referred to as systemic PSM throughout the thesis).

6.2.1. Contribution One – enhancing the theory of adoption of applied systems thinking

The first is a theoretical claim that advances our understanding about the circumstances in which systemic PSM is more likely to be taken up or accepted, and where it might be rejected, or even repudiated. The theory is described using two dimensions, or qualitative scales, one representing the relative decision status of the organisation(s) involved in a proposed intervention and the other attempting to gauge the organisation(s) appetite to investigate its

potential for reform and improvement. These dimensions are depicted in Figure 6-1.

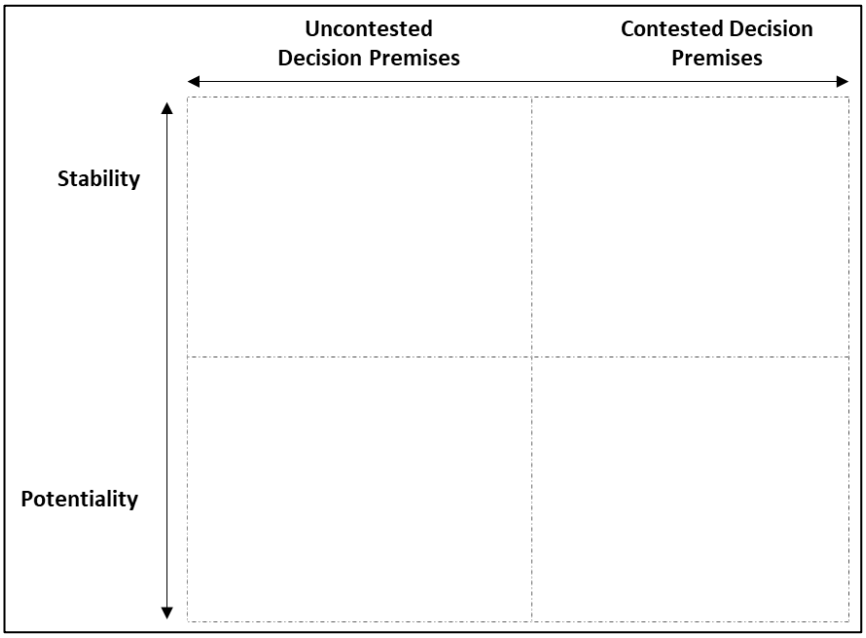


Figure 6-1 Circumstance Dimensions for Potential Interventions Using Systemic PSM

The horizontal dimension refers to situations where decision premises are perceived to be relatively uncontested or, at the other end of the scale, are perceived to be highly contested. This observation of relative agreement or disagreement over things like goals, resources, roles, structures etc. is well documented in the literature and has led to various theoretical conclusions but not the same theoretical interpretations as are made here. For example, Checkland & Holwell (1998) consider that most situations involve organisational members and non-members seeking various degrees of “accommodation” of multiple world views to be the norm and therefore one might expect substantial use of soft systems to help those involved to understand and seek accommodations with the appreciative settings of others (Vickers, 1995). Situations where consensus has been achieved are rare and are a “special case” (Checkland & Holwell, 1998, p.84). Jackson (2019) is more agnostic, seeing a plurality of participant relationships which he calls “unitary”, “pluralist” and “coercive”, and as was observed in chapter 2, a range of systems methodologies address these “ideal type” problem contexts. But both these accounts overlook the mechanism by which consensus (or discord) over goals, structures, resources, roles, and structures etc. emerges, and this is that they are - in the context of organisational interventions - most likely the result of previously (communicated) decisions. Any consensus or dissent will be

communicated as such if it is to gain *social* relevance (Luhmann, 2018). And if the decision logic is not fully appreciated or is considered less important, the significance of any “secondary complexity” (inherent in all organisational forms) tends to be underestimated. For this reason, the first dimension is labelled (contested/uncontested) *decision* premises.

The vertical dimension contrasts potentiality with stability. Potentiality is the degree to which the organisation(s), and the individuals managing it are willing to try new ways of thinking about the future of the organisation, potential changes, and reforms. The concept of “potentialisation” has been observed and employed elsewhere. Building on the work of Luhmann (2018), Pors & Andersen (2018) suggest that “potentialisation” is endemic in welfare organisations and they speak of a “potentialisation machine”, where managers in public administration are continuously reinventing the future. No such empirical claim is made here. Instead, the term is used to describe situations where organisations and their managers show more inclination to use different vehicles as a means of exploring the organisation’s potentiality or, as some systems writers prefer to call it, “improvement” (Flood & Jackson,1991; Jackson, 2019; Midgley 1996; 1998). Its contrast is “stability”. This should not be understood as some form of equilibrium or steady state (Luhmann 2012, p.292). Stability is the system using normal operations (processing decisions according to Luhmann). It operates dynamically, connecting organisational communications, accepting some change proposals, spurning others. Stability is therefore “pulsating” according to its own logic and “secondary complexity”, to use Luhmann’s terminology. It is the organisation’s own achievement and is not the result of an outside intervention using systemic PSM or any other intervention vehicle.

Having described both dimensions separately they are combined in Figure 6-2 which allows for an exploration of the potential for using systemic PSM in intervention.

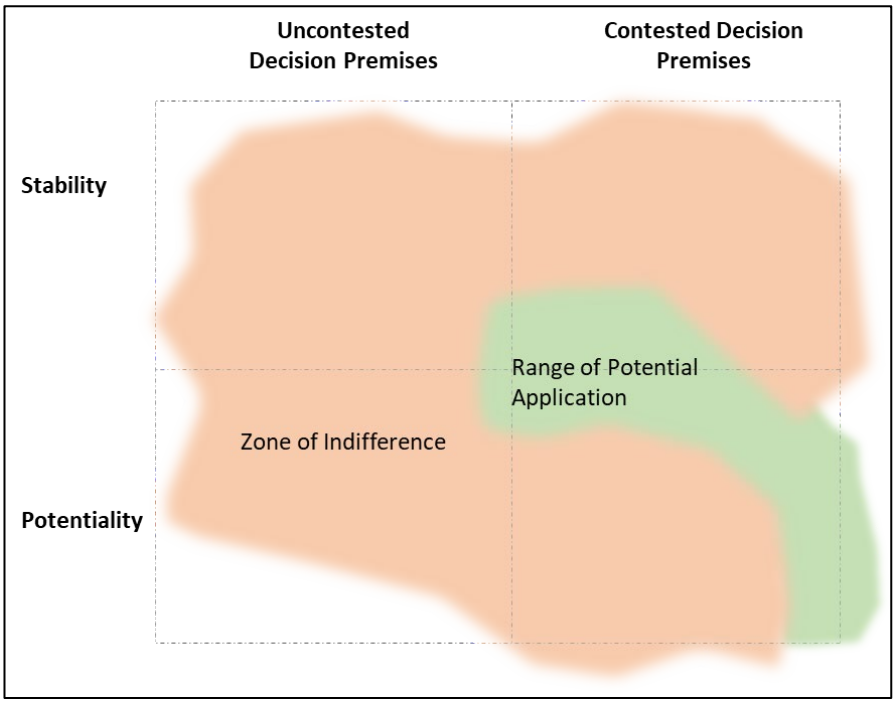


Figure 6-2 The narrowing of the range of potential application

The matrix advances our theoretical understanding of the adoption or acceptance of systemic PSM and the circumstances in which such methods will be rejected or even repudiated. It does so in two ways. First, applications of softer forms of systems thinking, or Soft OR, are better received and more likely taken up by managers in situations where an existing organisational decision premise is substantially contested and no longer functions as a “stable reference point” for future decisions (Achterbergh and Vriens, 2010b). In these circumstances, managers show greater interest in systemic PSM and become more willing to try its methods as a means of addressing perceived deficiencies with internal modes of generating information or “ways of seeing”. In other words, managers turn to systemic PSM if the existing self-generated “ways of seeing” are undermining or threatening the organisation’s self-production. Secondly, systemic PSM is more likely taken up in circumstances where managers show an inclination to explore potentiality. But this also presents managers with a paradox. Managers use systemic-PSM to “potentialise” an organisation’s future direction and use the results of the analysis and discussion as a means for deciding what can be done now ahead of a future that is unknown. But at the same time, they are reluctant to perform “bigger picture” analyses if the product of such analyses is perceived to over-specify a future course that could be ill-adapted to a future that is fundamentally unknown. In such circumstances managers turn away from systemic PSM, become sceptical

of the need to pursue (limited) conceptions of “comprehensiveness” in the here and now because these can be put off until more of the future is revealed. This latter point is illustrated in the bottom right cell of the matrix, where softer forms of systems thinking and Soft OR are thought to have the greatest chances of being adopted. Contested decision premises point to some measure of conflict and the inclination to explore potentiality is high. But this inclination has its limits and, save for circumstances where there is almost permanent conflict and extreme hostility to current decision premises, potential users turn away from systemic-PSM because of the perception that it may over-specify actions which may be regretted if the future turns out to be different.

The shapes drawn on the matrix are deliberately fuzzy; the matrix serves a heuristic purpose. It does not exclude, for example, the possibility of using systemic-PSM in all of the four quadrants, though it implies that applications in some areas will be met with indifference. The reason for this is that the matrix builds on the assumption that organisational forms have evolved and exhibit “secondary complexity” (Luhmann, 2018). They are therefore relatively self-sufficient in their own self-production. Contested decision premises are to be expected, given the nature of deciding “undecidable questions” (von Foerster, 2003). But organisations have evolved sophisticated but imperfect structures for dealing with these disputes and that is why the upper right quadrant is shaded as it is. The marked areas – “indifference” and “range of potential application” - provide some indication of the significance of the idea of “secondary complexity” (Luhmann, 2018) and the consequential narrowing of opportunity for the potential application of systemic-PSM. The implications of this emerging theory are explored in further detail below in section 6.4 below.

6.2.2. Contribution two – consolidating the literature

The second contribution is consolidating the existing literature on the obstacles and difficulties that impede the development and realisation of a flourishing systems practice. I argue that this contribution was achieved in the literature review chapter (chapter 2) where the existing research was classified into four main themes as follows:

- The difficulties of developing the necessary expertise.

- The perceived difficulty in demonstrating the value of the methods when the outcomes of intervention are unknown.
- The identity and suitable differentiation of systemic-PSM in relation to other management ideas.
- The difficulty in addressing the perception that systems thinking is “too radical”.

Together with the findings in this thesis, and acknowledging the consequences of contribution one above, these themes come together to form a single problematic with the ultimate aim of finding ways to overcome these obstacles so a sustainable systems practice can be developed.

6.2.3. Contribution three – enhancing methodological approaches to understanding systemic PSMs

The third contribution comes from some of the methodological choices that were made in the study. Substantial time was spent in the “field”, talking to managers about how they manage, how they tackle current problems and concerns, and how they navigate complexity. These conversations informed both the “research agenda” and the “action agenda”. In addition, and unique to this style of research, there is also what might be called a *dissemination* agenda (Huang, 2010). None of the managers had prior experience of systemic-PSM; they were the uninitiated of the thesis title, so not insignificant amounts of time were devoted to explaining and illustrating systems ideas and concepts. This is a rare feature of most mainstream management research. Indeed, the broader management literature is often criticised for being too far removed from the object of its research which is variously described as the “management research – practice gap” (Fincham & Clark, 2009), or the “rigour-relevance gap” (Starkey, Hatchuel & Tempest, 2009; Fincham & Clark, 2009). The research here involved what Van de Ven, Meyer & Runtian (2018) describe as “engaged scholarship”, working with practitioners whose evaluative criteria is very different from those who move in academic circles only. In doing so I argue that this produces more interesting results, and a deeper understanding of the problems of adoption and implementation of systems approaches.

Whilst some originality can be legitimately claimed against the benchmark of mainstream management literature the same cannot be said when comparisons are made to knowledge production in the systems literature. Here action research is the norm and there is some continuity with the styles and types of research that produced knowledge about SSM, critical systems thinking and Soft-OR, but with one main difference. That is most published case studies report “successful” interventions which are designed to indicate specific advances in theory or practice. Reports of less “successful” interventions, or those with only modest levels of success, are fewer in number, but no less important in deepening our understanding of how managers receive and take-up, and sometimes repudiate, systemic-PSM. The importance of such cases was recognised early on (Connell, 2001; Ormerod, 2001), but the call for more research on these experiences has not been heeded. This thesis makes a small contribution to the few cases that report difficulties and surprises with intervention.

Reichertz (2013, p.126) writes that research begins with “feelings of surprise” and that this is a fundamental aspect of abductive reasoning. The thesis began from a belief that the systems approach contains a set of powerful ideas and concepts with well designed, intuitive methodologies which can be put to use in numerous contexts. But the surprise element for me was that these ideas are little used by practitioners and are rarely talked about. Some interventions were shorter than I had envisaged, some much longer. The methodological choice was to recontextualise the case study material with the aim of generating new interpretations and explanation. Quoting from Charles Sanders Pierce (1903), Reichertz (2013, p.126) sums up this abductive approach:

> “Abduction makes its start from the facts, without, at the outset, having any particular theory in view, though it is motivated by the feeling that a theory is needed to explain the surprising facts… Abduction seeks a theory” (Peirce CP 7.218- (1903) quoted in Reichertz (2013, p.126)

Luhmann’s complex social systems ideas supply the necessary theory, and this is a decisive methodological choice in creating a better understanding of the adoption or acceptance of systemic PSM and the circumstances in which such

methods will be rejected or even repudiated. Save for one or two notable exceptions (e.g., Mingers, 2006; Jackson, 2019), Luhmann's work is little considered among researchers in critical systems thinking and Soft-OR. I argue that the absence of Luhmann's ideas in the theory and practice of systemic-PSM is partially addressed in this thesis, that this was a decisive choice in the abductive approach that is put into effect in chapter 5, and in doing so has created new possibilities for interpretation of why there is a lack of take-up of systemic-PSM. By opening this up it creates new opportunities for further research to help support the development of systems practice.

6.2.4. Contribution four – enhancing systems practice

Finally, the fourth contribution is to practice. And here practice is defined as personal, first-hand experience of using systemic PSM which creates opportunities for learning and the development of expertise. This in turn helps to develop knowledge about intervention methodology and method. One of the consequences of the theory outlined in 6.2.1 is that the circumstances in which systemic PSM might be adopted are perhaps narrower than first imagined. This has important practical consequences, and this will be taken up further in the discussion section below. In this section I argue that this thesis makes two contributions to practice.

6.2.4.1. "Finding out" about decision premises

First, the "finding out stage" of systems studies have generally focused on *who* and as consequence *what issues* will be pertinent to the study. This largely stems from the philosophical roots of the methodologies. Churchman (1979) encourages the exploration of different *weltanschaungen;* Midgley (2000) recommends "boundary critique"; Ulrich (1994) suggests that such boundaries should be established in dialogue with those involved and affected; Checkland and Poulter (2006) refer to "finding out" via "three forms of analysis" in which the "practitioner" has considerable influence over who and what is included. What precedes this analysis has yet to be defined precisely, largely because that would lead to an infinite regression problem. But general "finding out" comes after some form of recognition of an "unstructured problem" and "a feeling of unease" (Checkland, 1981). I argue that one way of improving practice and

complementing the above ideas is to ask direct questions about decision premises, as a means of gauging the degree to which such premises are contested. This may speed the process of learning in an intervention and may provide some indication of whether a systemic-PSM approach is appropriate. Ideas of the type of question that could be tabled early in an intervention are listed in chapter 5. For example, asking those involved in a situation whether deadlines are regularly met, or not, may provide some indication that a decision is contested. Naturally this would require further research to test these claims further.

6.2.4.2. Modelling

The second contribution to practice stems from the research finding that some of the participants in the cases exhibited a deep reluctance to construct, or to work through the detail, of relatively simple models to trigger new thinking about the framing of the problem and possible improvements. From a practice perspective modelling might best be performed “offline” and away from participants, in most situations. Clients are impatient for new insights and do not have time to go over old ground. This is always a risk with extensive and/or “primary task” models. The skill in judging how much of a model should be shown to clients is vital and the *translation* of modelling insight into questions and dialogue is a key practitioner competence. In addition to these observations, experience of practice also illustrates the “limits of comprehensiveness”. As above the limits of comprehensiveness have always been portrayed as an “ideal” to be pursued in principle, but practice has shown that clients and their organisations are as interested in “forgetting” as they are in remembering. Comprehensiveness as an unrealisable ideal can still have its sceptics and this is explained further in the discussion section below.

6.2.5. Boundary conditions (limitations)

Certain boundary conditions need to be observed at this point and can be summarised under two main headings: (1) intervention *in the context of organisations*; and (2) intervention as a *social* practice.

6.2.5.1. Intervention in the context of organisations

The theorisation above leans heavily on Luhmann's (2018) ideas about how *organisations* are constituted by decision communications. And this determination emphasises the role that organisations play in "restricting their own possibilities [and rendering] reality less complex" (Seidl & Mormann, 2015). An organisation's selections create normative points of reference for which future decisions can be connected. They constitute "boundaries of expectations", and their selections lead to sophisticated system formation with substantial capability to process information, self-produce and "perturb" the environment of other systems. A theoretical choice of this kind emphasises the role of organisations and downplays the role of human agency. There is understandable resistance to the idea of elevating the organisational form and its decisive influence on whether systemic-PSM is taken-up or rejected. Some forms of critical systems thinking actively resist this "hardening of the boundaries", of uncritically sticking to organisational agendas (Ulrich, 1983; Midgley, 2000; Cordoba & Midgley, 2008). In Midgley's (2000) "systemic intervention" methodology, for example, the boundaries of intervention are under constant scrutiny to ensure that the views of others are not unnecessarily marginalised. As a result, when debate about who is involved is "closed down too early", intervention becomes an ethical choice for the systems practitioner, and the practitioner may choose to walk away from the intervention.

A potential limitation of the present thesis then is that the interventions described in chapter 4 might well be caricatured as *organisation-specific* interventions. Rarely do they enter multiagency situations (save for the CC case), and barely can they be said to encroach on the territory of "super-wicked problems" (Levin, Cashore, Bernstein & Auld, 2009). However, I would argue that *organisations* are the context for most applications of systemic PSM and their intrinsic decision logic is of vital significance to those who seek to intervene and manage the situation.

It is interesting to note that in the main Midgley's work (e.g., Midgley, 2000) and his work with others (e.g., Midgley, Munlo & Brown, 1998; Sydelko, Midgley & Espinosa, 2021) takes place in multi-agency situations (Jackson, 2019). Whether this is by personal choice or is coincidental, it is suggestive that his

and his collaborators' work is needed when decision premises in some of the key agencies are the subject of major dispute, and that one or more of the sponsoring organisations has exhausted its/their "ways of seeing". If this is indeed the case, then this might further support the theory outlined in section 6.2.1. Systemic-PSM, like Systemic Intervention, becomes a specialist approach, and this raises further doubts on the idea that it has, or should have, broad appeal.

6.2.5.2. Intervention as a social practice

A second limitation of this thesis is that I have focused on the application of systems ideas and concepts as they are enshrined in particular systems methodologies and methods, with distinguishable labels – like SSM, SODA etc. - which, at the very least, are known by those researching and working in the systems field, or the profession of O.R. And of course, the methods associated with these approaches are generally known to be part of a class of methods known by the label systemic *problem structuring methods.* In effect, I have treated the ideas as largely "commodified" items (Heusinkveld, 2014). And these ideas were discursively shared with participants in the case studies. Consequently, the thesis has been relatively silent on the subject of private or cognitive systems *thinking*. Cabrera (2004), Cabrera, Cabrera & Powers (2015) have long believed that systems thinking can be simplified because of four universal rules which underpin the complete array of systems methods and approaches. These rules were described in chapter 2 and whilst simple to grasp, they can be combined in multiple ways to create new understanding, learning and insight. Various programmes that teach the rules are in progress in the US (Cabrera, 2011) and the extent to which these improve learners' thinking continue to be evaluated. A number of other authors (e.g., Burnell, 2016; Arnold & Wade, 2017) pursue the idea of systems thinking as a form of thinking, rather than following "baffling" methods (Cabrera, Cabrera and Powers, 2015). It will be interesting to see the results of these experiments. However, because systemic PSM takes a dialogical approach and thinking is – mercifully - private, the research did not examine any inferences that could be made.

6.3. On the nature of the contribution

The contribution above has been achieved through a mixed strategy of “gap spotting” and “problematization” (Alvesson & Sandberg, 2013). My argument throughout is that the lack of adoption is under-theorised. Our existing knowledge points to some explanation, but these accounts tend to neglect and underestimate the “secondary complexity” which is present when intervention takes place in the context of organisations. Systems and Soft OR scholars have tended to ignore these deeper explanations that influence the lack of adoption or take-up, suggesting that it can be explained by lack of awareness (Ackermann, 2012), or that its outcomes are so unpredictable that its value is doubted (Tully et al, 2019). The concept of secondary complexity fills some of the “gap” that is implied in a gap-spotting contribution to knowledge.

Insofar as this thesis makes a “revelatory” contribution (Corley & Gioia, 2011; Nicholson, LaPlaca, Al-Abdin, Breese & Khan, 2018), the problematization of existing assumptions in Soft-OR, soft systems thinking and critical systems thinking are presented in chapter 5, where I refer to the tendency in systems approaches to focus on the problems and, at a higher level of abstraction, problem contexts that managers and organisations face, and tend to ignore the inherent decision logic of the organisation in which the intervention is carried out. This tendency, or taken-for-granted assumption, might reasonably be traced back to the early foundations of O.R. where the belief that a set of techniques used in war time might be effective for urgent *problems* in society took hold (Blackett, 1995). Of course, O.R. practitioners and those who came later with systems ideas, had in mind a desire to support *decision* makers, but there is a heavy emphasis on how individuals see and define problems afresh and less attention on the organisational decisions that arguably led to those problems that are subsequently identified. The alternative assumption ground is *decision*, and in Luhmann I find a resource which emphasises the differences between decision and the *results of decision*. The second assumption I question – perhaps better described as an assertion – is the notion that soft systems ideas *can* be applied to a huge application area (Checkland & Poulter, 2006). No one can reasonably claim they cannot; but this is not the same as asking whether they *will* be applied. Challenging these assumptions creates a range of

interesting and useful ideas, but I leave the judgement on interestingness (Davis, 1971) for others to make. Hopefully, it occupies a middle point between the “absurd” and the “obvious” (Alvesson & Sandberg, 2013).

This characterisation of the contribution is not without difficulties. I have thought long and hard about classifying it in terms of the generic strategies identified by Alvesson & Sandberg (2013) and Nicholson et al (2018). The problem with classifications and typologies is that they can become too rigid and can restrict an unfolding strategy. Nicholson et al (2018) do not proscribe boundary-crossing contributions and in their analysis of over 500 papers published in industrial marketing journals they do find contributions that can be coded to all four of their “meta-type” contributions (Revelatory, Incremental, Replicatory, Consolidatory) (Nicholson et al, 2018, p.210). This begs the question of whether the thesis contribution is to be classed as “revelatory” or “incremental” since I claim it is achieved via a combination of neglect spotting and problematization. I am not entirely convinced that “revelatory” (Corley & Gioia, 2011) contributions are that frequent given that research in management and organisation is full of competing perspectives and social scientists have a tolerant attitude to the co-existence of different theories and explanations because human life is so messy and unpredictable (Macintyre, 1985). For these reasons, I suggest that the contribution is incremental.

6.4. Theoretical and practical implications: a discussion

The starting point for this thesis is the question about why there has been so little adoption of systemic-PSM in general management. There is much discussion about systemic-PSM in the academic literature but next-to-no conversation (or even awareness) about the methods among general managers. The findings in chapters 4 and 5 showed that there is a turning away from systemic-PSM when managers feel able to use their own “ways of seeing” to tackle the issues and messes that confront them. That organisations have developed their own more-or-less sophisticated “ways of seeing” is no surprise, but when this is translated into the concept of secondary complexity it changes the way we think about systems thinking and Soft-O.R. and their possible contribution to managers and the field of management. The theory advanced by this thesis has several implications. First, the idea of a comprehensive

understanding or “adequate” understanding brought about systemic-PSM can no longer be seen as an unquestionable good. Secondly, the concept of “secondary complexity” should be taken more seriously when planning interventions and further research to understand how secondary complexity constrains and complements systemic-PSM is required. Finally, there should be no prima facie expectation that systemic PSM should be more widely adopted. The three main insights are discussed further in sections 6.4.1 to 6.4.3 below.

6.4.1. Comprehensiveness, adequacy, potentiality & contingency

For a long time, followers of Churchman have emphasised the need to create an “adequate” understanding of phenomena, or an “adequate” understanding of the stuff of problem situations, rather than the unattainable “comprehensive” understanding which was always understood as an ideal to be pursued (Ulrich, 1983; Midgley, 2000; Rajagoplan & Midgley, 2011). No one can say precisely when an intervener will know when an adequate understanding has been realised, suffice to say that it is reckoned on being “rich” and “complex”, and “while *full* understanding is unattainable, *greater* understanding than we currently have at any particular moment is always possible (Midgley, 2000, p.36, emphasis as original).

However, the findings in this thesis appreciably extend this problematic and there is empirical substantiation in a number of the cases that users of systemic-PSM turn away from such methods, or show resistance to them, when they perceive that the analysis creates too detailed an understanding. As outlined above, there are two principal reasons for this turning away:

1. The study (usually the modelling) goes over known features of the problem situation. In effect users believe they are unnecessarily going over “old ground”.
2. Users avoid a detailed, “near-comprehensive” understanding of the situation because of a desire to maintain a form of contingency which has been labelled as “potentialisation” (following Luhmann, 2018; and Barel, 1979 – quoted in Luhmann, 2018). In effect, users suspend further investigation and further understanding because they know the situation they are managing will change.

These ideas are summarised in Table 6-1 below which shows a continuum from "impoverished understanding" to the unattainable ideal of "comprehensive understanding":

	Impoverished Understanding	**Sufficient Understanding + Contingency**	**Adequate Understanding**	**Comprehensive Understanding**
Label	Impoverished	Potentialisation	Critically Adequate	Unattainable Ideal
Implied level of investigation and "sweeping-in" (Churchman, 1974)	None/Little	Some. Deemed sufficient by those involved.	Extensive without "paralysing action" (Ulrich, 1983)	Comprehensive
Implicit time orientation	Present (Now)	Present	Present and Future	All time

Table 6-1 A continuum of different levels of "understanding" in systemic inquiry

This is important for a number of reasons. It raises important questions about the level of detail a facilitator should be expected to go into. It further consolidates concerns about the level of expertise required to use systemic-PSM effectively. It raises questions about appropriate levels of modelling and investigation. Advocates of Soft-OR set much store in models and model building. In their review of the "characteristics of problem structuring methods", Smith & Shaw (2019) mention *models and modelling* in 9 of their 13 questions to determine whether candidate PSMs can be said to belong to the PSM family of OR methods. One of their questions asserts that the model serves the function for an "audit trail", "grounded in the situation being studied" (Smith & Shaw, 2019 p.408). But the findings in this thesis show that many managers can resist modelling because it is perceived as creating a requirement to seek out information that is not strictly necessary for the next action, or decision to be made. If Soft-OR creates the impression that its overriding purpose is to document or to leave artefacts and models, then this may result in client and participant indifference. If managers perceive that "adequate" (thorough) investigation and understanding results in committing them to future scenarios which reduce their freedom to choose differently and remain flexible, then they again may spurn the opportunity to fully exploit systemic-PSM. On this point it

is interesting to note the contrast between Soft-OR and Midgley's (2000) SI methodology, where modelling is less dominant, and the models displayed to illustrate intervention are usually highly abstracted summaries.

"Adequate understanding" is important to avoid paralysis, but potentiality and contingency are also important aspects of an intervention. How systemic-PSM should be designed such that interventions leave enough contingency is difficult to specify. What is more certain, however, is that these observations place even greater strains on the expertise required to effectively manage an intervention using systemic PSM.

A second consequence of this reasoning directly addresses the notion that problems are *structured* as a result of intervention. Managers resist *structuring* the problem because, as above, it is perceived as locking them into positions that reduce their freedom to act. Some of the early pioneers of systemic-PSM, Checkland (1981) for example, developed SSM as an antidote to poorly structured management interactions, to provide an ordered process to combat the "thrashing around" he observed. But this all too easily ignores the potential function that "thrashing around" may serve. Potentiality is important to managers. Forgetting is important. And so, comprehensiveness or "adequate understanding" has its limits. Structure implies that ideas are "constructed" or "arranged" according to a plan. And no one wants to be too tied down. Eden & Ackermann (2006) have long since suggested that the name "PSM" is not descriptive and prefer to see the methods as "facilitated agreements to act", to which I would concur. However, an alternative to this is that they stimulate the organisation, they are environmental "perturbations".

6.4.2. Secondary complexity is underestimated

Critical systems thinking (Jackson, 2019; Midgley, 2000; Mingers, 1997b) has led the way in encouraging systems methodologists and systems practitioners to reflect on the assumptions they make when designing methodology or engaging in practice. Similar assumptions are evident in Soft-OR because the originators of the methods urge those who take them up to avoid being atheoretical (Eden & Ackermann, 2018). However, the number of paradigms that highlight both the strengths and weaknesses of various systems

approaches is still finite, and the choice of 4 or 5 paradigms seems to be restrictive and seems to be driven by academic fashion. Zhu (2011) asks “why these four paradigms…” and not others, or a different four? This is a reasonable objection and prompts the question why critical systems thinking has underplayed Luhmann’s theory of autopoietic systems.

As for systemic PSM, the methods are aligned to the interpretive paradigm. Human beings have different perceptions of social reality, they see things differently, bestow different meanings to events and seek accommodations of their views with others. This means that private subjective feelings are translated into inter-subjective understandings via language.

However, by adopting a Luhmannian lens in chapter 5, I explicitly chose to understand the interventions *sociologically*. Luhmann’s theory of organization argues that organizations are constituted by decision communications. They are talked into being, though this is slightly misleading because Luhmann’s employment of second-order observation puts epistemology over any ontological claim. In effect organisations *are “social”* it is not something that they “have too” (Achterbergh & Vriens, 2010b, p160.)

Critical systems thinking seems to oppose the idea of radically autonomous social systems that are made up of recursive networks of communications that self-produce. We ordinarily refer to these social systems as interactions, organisations, or societies. For some systems scholars they are problematical ontologically (Mingers, 2006). But they are a phenomenon that is part of the material world. And just as physical autopoietic systems “take” or assume matter and energy from their environments, so do networks of communications “take” what they need – psychic systems – for their processes of self-production. Critical systems approaches have not adequately responded to the theoretical developments that have come from Luhmann’s work. The implications are not fully grasped. Why is this important?

There are two reasons. First, by excluding or playing down the idea that organisations are constituted by decision communications this leads to an underestimation of the secondary complexity that comes about as a result of system formation. Even though these “objects” – recursive networks, non-trivial

machines, self-referential systems, however we wish to refer to them – are difficult abstractions, most of us willingly acknowledge that there are person-like entities that we regularly experience, and we refer to as organizations. As members or non-members, we adapt our behaviour to the expectations that these organizations create, we even attribute decisions to such entities in “acts of reification” (Checkland & Holwell, 1998). It does not over-stretch imaginative possibility to see organizations as capable of “making a difference that creates a difference” (Bateson, 1972), of provoking and seeking an “irritation” that helps the organization to self-produce. Adopting this perspective encourages us to consider the idea that social forms have emerged with their own capabilities to create surprise and make differences. In this way, because of organisational self-sufficiency, it makes the demand for systemic-PSM smaller than we might normally think. And again, this reinforces the argument that systemic-PSM is perhaps viewed as a specialist tool, required in specific circumstances, and not necessarily one that is always relevant to general management. An attempt to show systemic PSMs in relation to “secondary complexity” is shown in Figure 6-3.

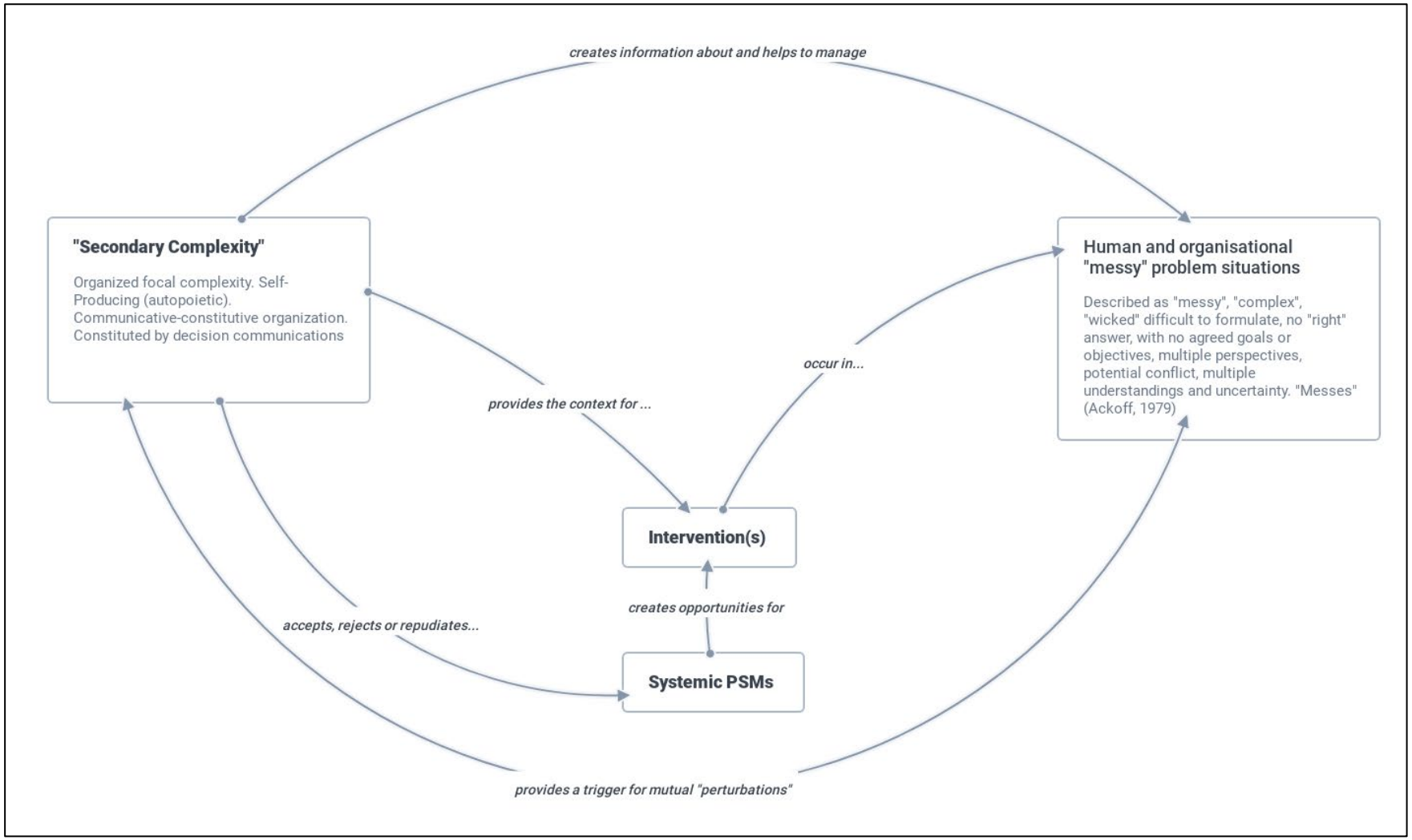


Figure 6-3 Systemic PSMs in context

The second reason why “secondary complexity” is important relates to debates about theoretical and methodological pluralism; debates that have raged for some considerable time (see Jackson, 2019; Midgley et al., 2017, Mingers, 1997b; Zhu, 2011; Brocklesby, 1997; Gregory, 1996). Given that CST is committed to pluralism, the absence of Luhmann’s thinking on organizations is even more striking, because if the critical systems literature treated organizations as radically autonomous systems capable of making and marking differences, we could extend the notion of pluralism even further. Midgley’s (2000) comes closest to this idea with his notion of knowledge constructing entities. In doing so he is not wedded to particular paradigms as Jackson (2019) appears to be. The intent of paradigmatic awareness is to make methodologists and practitioners critically aware of their blind spots, an alternative paradigm can provide the critical resources to a methodology that was built form different paradigmatic assumptions. But the same is true of critical systems thinking. It needs to be aware of its own blind spots – and one blind spot is that it downplays how organisations create more or less sophisticated ways of seeing themselves, of self-observation. There is little evidence to suggest that organisations are prone to blindly follow plans in a machine-like fashion or are beholden to more “popular”, commoditised management ideas and methods. They have developed their own complex structures. Only by understanding secondary complexity can we begin to think about the potential of systemic-PSM and the wider normative project to make systems thinking more relevant to managers.

6.4.3. Systemic PSM as a specialist enterprise

In *Critical Systems Thinking and the Management of Complexity*, Jackson (2019) presents systems thinking in the making, a 40-year development, a portrait of growing confidence and diversity, and a detailed history and application of the 10 “most well-known” set of systems methodologies, theoretically robust and “proven” in practice. The argument is that managers need and want these ideas to manage the messes and wicked problems that they confront and without them they will likely take up the “fads”, “fashions” and “quick-fixes” that are “anti-systemic”, concentrate on the parts of a system only

and neglect the whole and its interconnectedness. The fashions may enjoy some short-term success, but in the long run they fail because they are not "systemic" enough (Jackson, 2019). Writing about Local Government (LG), Hobbs (2019) reports the calls being made to replace the mechanistic, silo-operated efficiency agenda that has dominated LG reform over the last 30 years. She sees systems thinking as providing some answers to help build capacity in LG and writes of a demand-supply mismatch. The underlying assumptions are similar for both writers. We work in silos; we manage according to a mechanistic metaphor.

In contrast to these assumptions, the findings in this thesis indicate that the demand for systemic-PSM may well be less than envisaged. There is curiosity for sure, but there is also some level of indifference, and whilst the above writers write from a pluralist perspective, and therefore draw on several systems paradigms to make their diagnosis, they seem to overlook the principle of system differentiation, specialization and hierarchy which are part of organismic approaches to systems thinking. They overlook the notion of "secondary complexity" as discussed above. The managers in the cases showed no signs of desperately seeking new ideas. They were part of organisations that had developed expectations about expectations, they were conscious of their organisation's history, their organisations had developed their own sophisticated ways of processing information, of triggering "irritations" that make a difference.

It could be argued of course that the thesis contains very limited empirical evidence. This is a valid criticism and can only be addressed by more research to explore why indifference comes about, and why internal generated complexity seems enough. Such research would take seriously the heuristic device illustrated in Figure 6-2. The research would try to find out the limits of secondary complexity. This is important if applied systems thinking in management is to prosper. For the time being, I argue that a more sober assessment of demand for systemic PSMs is taken into account when considering general management.

At the start of this project, I identified three broad research aims, and these aims are now met. The thesis examined the practical relevance of systemic PSM in four case study organisations. Four interventions using systemic PSM

were designed, planned and completed, with participants in four very different organisations. Discourses on problem-solving and on how managers and organisations address complex situations were orchestrated as a result of the four interventions, allowing comparisons to be made to existing organisational practices. This helps to build theory of how, why and when practising managers might turn to systemic PSM and when they might avoid it, or even repudiate it. These are complex processes and further investigation of this topic is actively encouraged. The theory presented in this chapter complements the existing knowledge we have about barriers to adoption of systemic PSM.

6.5. Conclusion

This chapter has made a case for four contributions to the theory and practice of systemic-PSM, the main import of which is to provide a better understating and knowledge of the concept of “secondary complexity”. The concept describes what happens when systems form and develop more or less sophisticated “ways of seeing” and ways of managing focal complexity. We usually speak of “organization” when we refer to secondary complexity, and because organizations are the context for interventions using systemic-PSM, secondary complexity will have a bearing on whether the methods will be accepted or repudiated. Secondary complexity is both a complement to, and a potential constraining factor for, the adoption and successful deployment of systemic-PSM.

Chapter 7 Final Thoughts

7.1. Introduction

In this short final chapter, I attempt to summarise the thesis and work through the implications of the findings from a normative position. This leads to a consideration of the opportunities for future research.

7.2. A short summary of the research

This thesis began with a question: why are systemic PSMs not more widely adopted by practising managers? The existing literature pointed to some answers. Proving their value ahead of the intervention is difficult (Tully *et al*, 2019), the level of expertise and craft required can be burdensome (Ackermann, 2011; Eden & Ackermann, 2006; Keys, 2006); they are not distinctive and coherent enough to be recognised in practice (Yearworth & White, 2006), and they may not be disseminated to those who need them (Morrill, 2007). Finally, Ackoff (2006) reminds us that systems thinking is too "radical". And yet, at the same time, systems thinking and systemic PSMs are the subject of vigorous debate in the academic literature. I argued that the decision to adopt systemic enquiring methods is under-theorised.

In order to address this perceived gap, the thesis investigated four *concrete* cases of systemic PSMs in action. They were written up in a narrative fashion in the hope that readers could experience the cases vicariously, inviting interpretation. I argued that they deepen our understanding of how managers receive and take-up (and sometimes repudiate) systemic PSMs. Theorising the less studied, but equally important, cases where intervention success is mixed, permitted different experiences of acceptance, indifference, and repudiation. Comparisons were made to extant and in-house problem-solving approaches. The data show numerous examples of participants accepting systemic approaches but also turning away from them in some instances. The organization(s) as the context for systemic PSM interventions was emphasised by using Luhmann's complex social systems theory as a means to reinterpret the cases and shed some light on some of the surprises that came from the

data. In line with Luhmann's (2018) theory, the decision logic of each case study site was emphasised leading to an emergent theory.

I argued in chapter 6 that the thesis claimed 4 contributions. I devised a matrix to illustrate the likely circumstances in which systemic PSMs will be adopted. I argued they are more likely in circumstances where existing organisational decision premises are significantly contested or deemed to be no longer fit-for-purpose. In effect organizations have reach a hiatus and seek alternative "ways of seeing". But organizations and their managers must be curious too, they must be interested in potentialisation. However, it would seem that potentialisation has its limits; and excessive potentialisation thwarts future decisions. Used as a heuristic device, the matrix narrows the potential opportunities for greater adoption of systemic PSMs. I argued that these ideas come together with the obstacles to adoption referred to above to create a single problematic.

7.3. A normative perspective

Readers of this thesis, especially those who are committed to systems practice, may think that the overall prognosis is somewhat gloomy or pessimistic, but this need not be so. When Churchman wrote his understated fourth principle: "The systems approach is not a bad idea.", (as cited in Jackson, 2019, p351-352) he had in mind that all worldviews should be subjected to serious critique before being accepted and "solidified" as the status quo. It is easy to see how Churchman's ideas have influenced many of the scholars quoted in this thesis. His principles seem as relevant as ever. Perhaps now, more than ever, there is a need to discuss values, to push the boundaries, and to evaluate the 'bigger picture'. And when someone tries to widen the boundaries to create deeper understanding and is contemptuously brushed aside, we need to know how this is so. Churchman's point about "solidification" is equally important and to understand how this occurs I argue that we need to understand more about "secondary complexity" and how it obviates the need for systems practice.

7.4. Future research

I argued that this thesis pushes our knowledge of systemic PSMs further. However, it leaves many avenues unexplored. I have made the case for a better understanding and recognition of the concept of “secondary complexity”. Though the theory related to this idea is “complex” and overly “abstract” (Seidl & Mormann, 2014) it remains within the arc of general systems theory and therefore is possibly a source of conceptual development which may be embodied in systems methodology. In this way, this thesis partially addresses Paucar-Cacares & Jerardino-Wiesenborn’s (2020) call to create “conversations” between Soft OR approaches and constructivist theories. Secondary complexity has major implications for understanding and extending pluralism, which has been a major concern of systems theorists and practitioners for several years (Jackson, 2019; Midgley, 2000; Mingers, 2006; Mingers & Brocklesby, 1996).

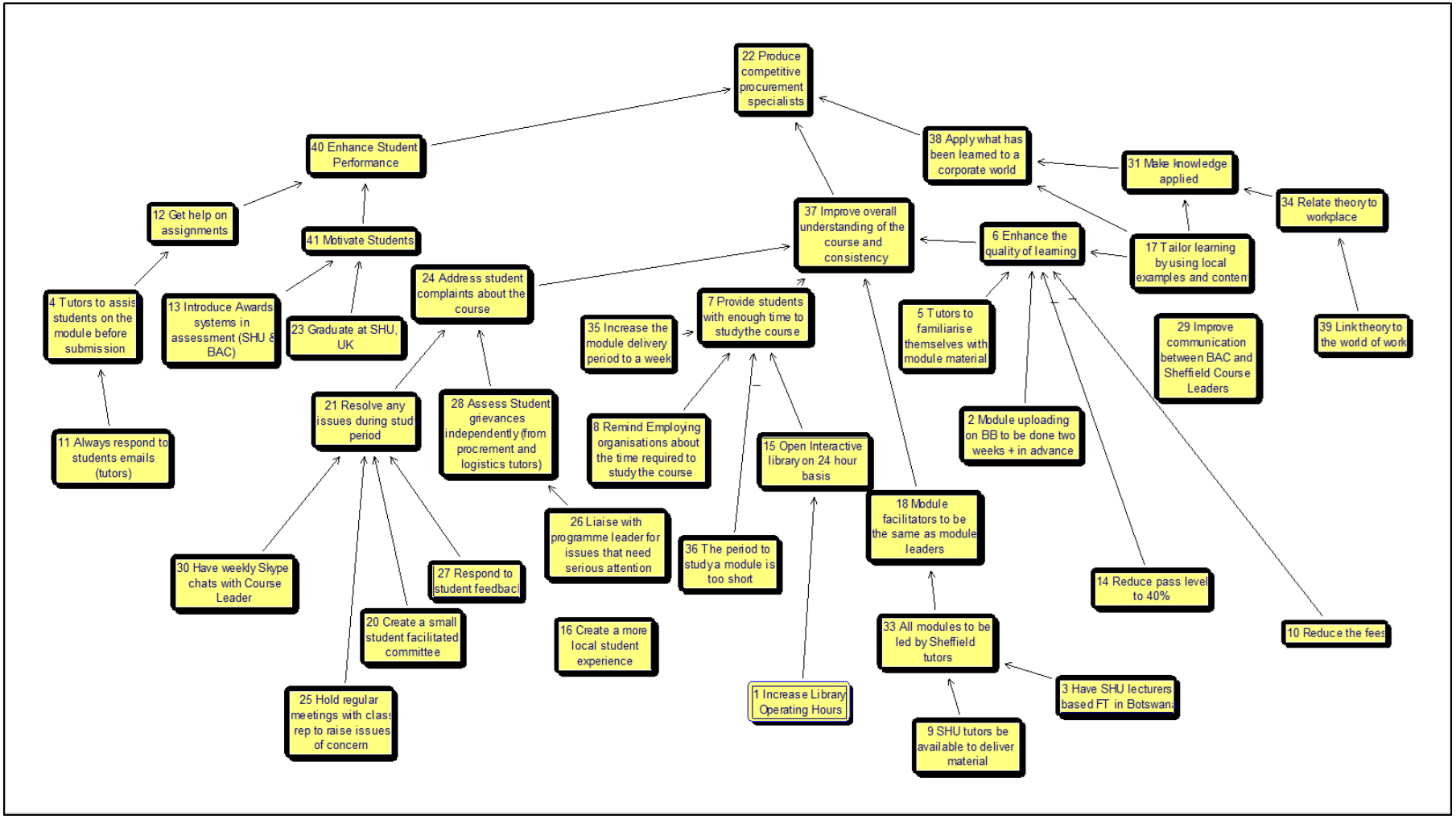
The communicative constitution of organizations (CCO) literature (Cooren & Seidl, 2020) offers substantial scope to take Luhmann’s (2018) ideas further and apply them to systems practice. This would strengthen understanding of “secondary complexity” by using different methodological approaches – conversation analysis, for example (Schegloff, 1991) and longitudinal studies – to help improve understanding of the decision logic of organizations and how this links to systemic PSM adoption and the wider debates about framing and re-framing problem situations (Brocklesby & Mingers, 1999) ultimately leading to enhanced systems practice.

APPENDICES

Appendix A Strategic Options Development and Analysis (SODA)

Described as an "approach", a "method" and wrapped up in the methodology known as "Journey Making", SODA (Strategic Options Development and Analysis) is derived from the work of Eden and Ackermann (Eden & Ackermann, 1998; Ackermann & Eden, 2011; Bryson, Ackermann & Eden, 2014).

The SODA method gives primacy to individuals and their subjectivism, their construction of reality; their theories in use. The method is underpinned by social-psychological theory, more specifically Kelly's (1955) "Theory of Personal Constructs", a cognitive theory of how individuals make sense of their world. For Kelly, individuals are at the mercy of explaining events and actions, and in many ways act like scientists, predicting the consequences of events and actions, and asking why events and actions have come to be. Ackermann & Eden (2011) suggest that this implies seeing the individual as a "problem finder/solver", able to relate a variety of "concepts" to form a unique, cognitive map (or "system of concepts") of their experience. Transferred to the domain of problem structuring and problem solving, the "system of concepts" becomes a means for a client, or client group, to express their experience of a problem situation. A fragment of one such cognitive map is depicted in Appendix Figure 1. This shows just 41 concepts. A cognitive map can be combined with maps from other individuals, and quickly a facilitative device emerges, which can be debated, questioned and subjected to analyses. The map or diagram might have as many as 40 to 120 concepts or nodes (Ackermann & Eden, 2011, p. 29) for one problem solver, and several hundred for a group problem solving team.



Appendix Figure 1: Example of Strategy Map for improving a Master's Degree Course

The philosophy and methodology of journey making permits a wide range of choices for an intervener/user to design the intervention. A user can interview individuals using ordinary language to capture data about the problem situation and then code these into linked concepts to form a map. The map can be validated at a second meeting with the individual, and adjustments made. Alternatively, a group map can be built in a group setting making problem solving and strategy-making "inclusive, analytic and quick" (Eden et al, 2009). Choices are also available when the primary aim of the intervention is to create a strategy that "people want to implement" (Ackermann & Eden, 2011). Workshops can be arranged such that they have a particular slant. For example, the workshop could be structured around the management of *key issues* an organisation faces, or *the strategy as purpose,* or *strategy as competitive advantage*, or *strategy as stakeholder management* (Ackermann & Eden, 2011). Flexibility is required, because all clients are different and may have a preference for putting to one side goals that can be, to some extent, taken-as-given, so that the focus is on conversing about possible options for action. Other clients may wish to start their focus on questioning goals from the outset (Ackermann & Eden, 2011). SODA is also supported by ideas on negotiation (Fisher, Urry & Patton, 1991) and international conciliation. The purpose of this is to recognise the social and the strategy-as-negotiation aspects of strategy making and problem solving. In some of the earliest SODA models, users of the approach are encouraged to consider the opposites or contrasts of all concepts. For example, a concept to "support X" might be contrasted with "resistance to X", or "ambivalence to X". Careful wording of the contrast - in this case resistance or ambivalence - often allows users to think of further refined options for dealing with the problematical situation. So, a strategy to support X in a chain of argument may also have complementary strategies to reduce ambivalence towards X. These are often subtly different to participants, and may make for more robust strategies or improvements, that are more generally accepted.

At all times, Eden, Ackermann and various co-researchers are at pains to point out the social nature of problem solving and strategy making. The *process* is as important as the *content*. The aim of an intervention using SODA is to change both thinking and action for those involved (Ackermann & Eden, 2011, p.14).

Careful chains of argument may be captured by means of strategy maps and cognitive maps, but these, in turn, will be negotiated by those involved and there will be "winners and losers", according to Eden et al (2017). Passionate claims about what must be done will be defended, and organisational politics will be to the fore. But if actions to achieve outcomes can be agreed, then a "powerful" sense of commitment to action and strategy becomes possible, within a problem solving/strategy making team. This is as important as any "analytically correct strategy", because the latter is deemed "useless" without commitment from those involved (Eden at al., 2017, p.15). So, any intervention must seek to work with a more-or-less cohesive team which permits adequate levels of convergent and divergent thinking. SODA recommends methods of working that seek to address some of these demands, for example, in a group setting, individuals can contribute concepts relevant to the problem without these being challenged or "shot-down" when they first surface. This technique ensures some procedural justice and protects a modest measure of divergent thinking. But without effective facilitation, it is very easy for teams to return to stereotype, leading to "artificial" and "superficial" forms of agreement, not highly motivated agreement. The importance of facilitation should not be underestimated. Recent research (Ackermann, 2012; Ackermann et al., 2020) underscores this difficulty, and what might be done about it through training and teaching. There is a sense that this may retard adoption. But there is evidence that some managers become better facilitators when they become more accustomed to the language of PSMs and get more time for practice (Franco, Shaw & Westcombe, 2007).

Further information on this method can be found here:

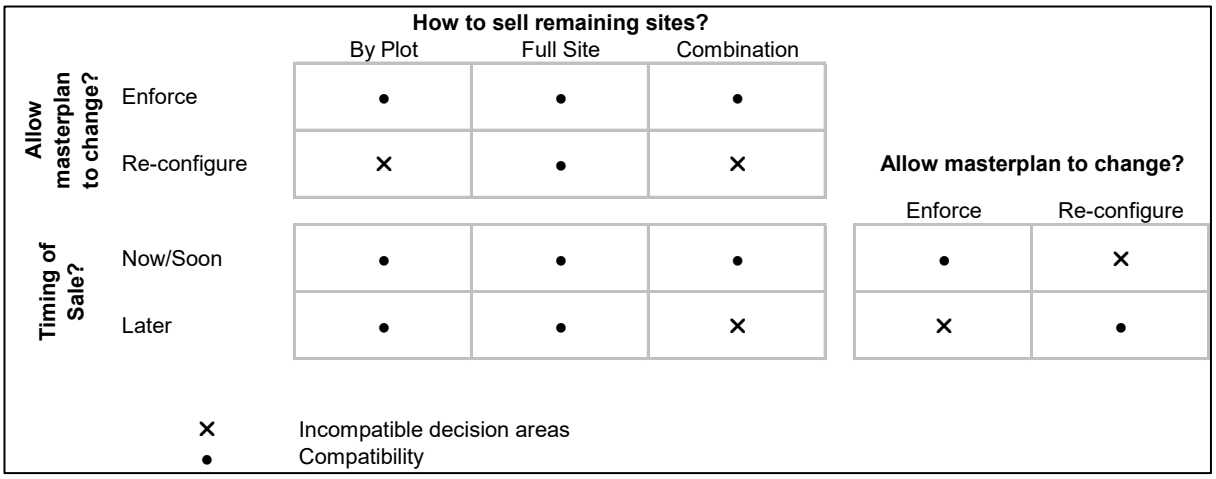
Ackermann, F., & Eden, C. (2011). *Making strategy: Mapping out strategic success* (2nd ed ed.). London: SAGE.

Appendix B The Strategic Choice Approach (SCA)

The Strategic Choice Approach (SCA) is most closely associated with the work of John Friend. Its origins lay in Local Government research in the 1960s: a four-year study of decision making, policy making and planning with access to all levels of a single authority. The researchers - one of whom was Friend - carried out numerous interviews with both officers and members**,** including elected politicians and members of the opposition. The Local Authority made significant decisions on major issues such as transport, education, housing, development, and observations were made at formal and informal meetings, across the board (Friend & Jessop, 1977, quoted in Friend & Hickling, 2005, p.5). This experience of working with decision makers and managers has been repeated ever since in countless organisations, private, public and voluntary. The ideas of SCA are therefore rooted in actual management practice. The experience of developing SCA is not dissimilar to other methodologies which have emerged as a result of action research projects.

SCA works through four modes – shaping, designing, comparing and choosing. These are presented in a linear fashion, but users will move in and out of the four modes, quickly, sometimes unconsciously. In the shaping mode, candidate "decision areas" are listed. These are opportunities for choice "in which two or more different courses of action can be considered" (Friend & Hickling, 2005, p.25). Instead of taking each decision area in its turn users are prompted to see if there is any potential benefit in looking at the mutual relationships between decision areas. This is a matter of judgement. The temptation is to say that everything is related, but some decision areas might better be considered together. For example, an organisation considering decisions about renewing a lease on a property may do this alongside a decision to invest in new equipment. Once decision links have been established, a "problem focus" can be chosen. This represents a cluster of inter-connected decision areas. Various visual, diagrammatic tools are used throughout the process of SCA and a simple decision graph is often used, usually using a whiteboard or on flipchart paper so that participants have an "audit trail" of the process (Smith & Shaw, 2019). In the *design* mode, users identify the options for each decision area and consider compatibility with other options in mutually related decision areas.

Compatibility tables are produced. An example from my own practice is provided below in Appendix Figure 2.

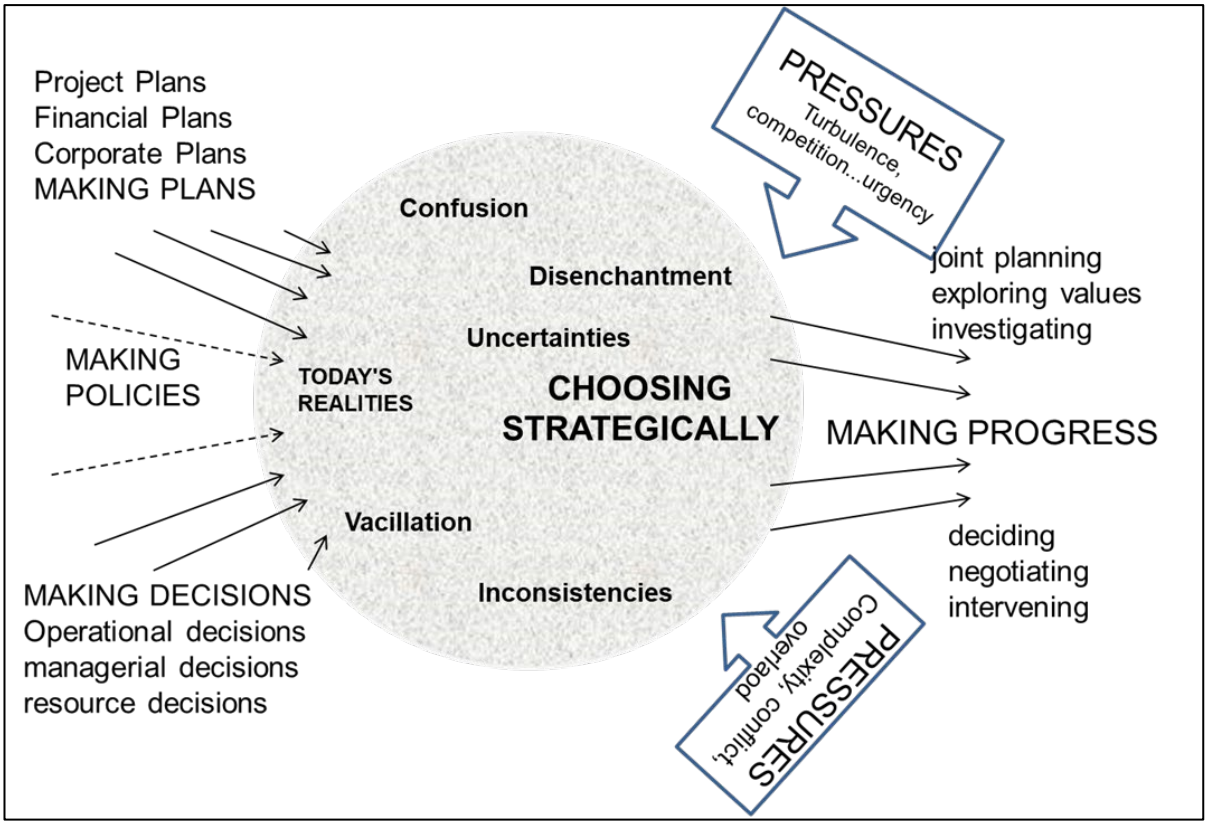


Appendix Figure 2: An SCA compatibility table

The design stage reaches a conclusion when various “decision schemes” are identified, showing combinations of multiple decision areas. In the *comparing* mode, users compile various evaluative criteria in which to compare the decision schemes. This normally results in a shortlist of feasible and desirable schemes. During the ranking of schemes, sources of doubt emerge, which leads to a listing of uncertainty areas. The doubt is inevitable because thinking through decision areas, options, credible schemes and evaluations is achieved quickly. The outputs are little more than working assumptions and once users begin to compare various schemes, doubts emerge about the level of knowledge of the decision problem. These doubts are classified as: uncertainty about the environment (UE), uncertainty about guiding values (UV), and uncertainty about other related decisions made by others (UR). At this stage – the *choosing* mode - users will debate what actions can be taken now and what needs to be done to address some of the doubts. Uncertainties regarding the environment are generally technical in nature. Doubt may arise about whether markets will change, how social tastes may change or external forces generally. Such doubts might be reduced with more research – surveys, forecasts etc. In this way, *decisions* to obtain more information may be made. Reduction in UV may require more meetings with stakeholders to test opinion and clarify objectives. Reduction in UR may require better coordination with others whose own decisions will mutually affect outcomes for both parties. There is no real end to this process of strategic choice, but notionally users will agree a

"commitment package" which includes actions that are taken now and decisions that are deferred, pending better information, better understanding of objectives, or better coordination of related decisions. This is, for Friend and Hickling (2005), a continuous process of choosing through time.

Friend and Hickling use the term "planning" to mean strategic choice, the terms are synonymous. The term "Planning" has lost some of its appeal, perhaps too much of a strong association with "top-down" approaches, or command and control. But the phrase, and the title of their book, "planning under pressure" epitomises their argument. Managers and decision makers are in the thick of things, dealing with pressures, coping with different perceptions of affairs, building relationships, seeking clarification. Appendix Figure 3 adapted from Friend and Hickling (2005) summarises this view. SCA is not some back room, one-off exercise run by experts.



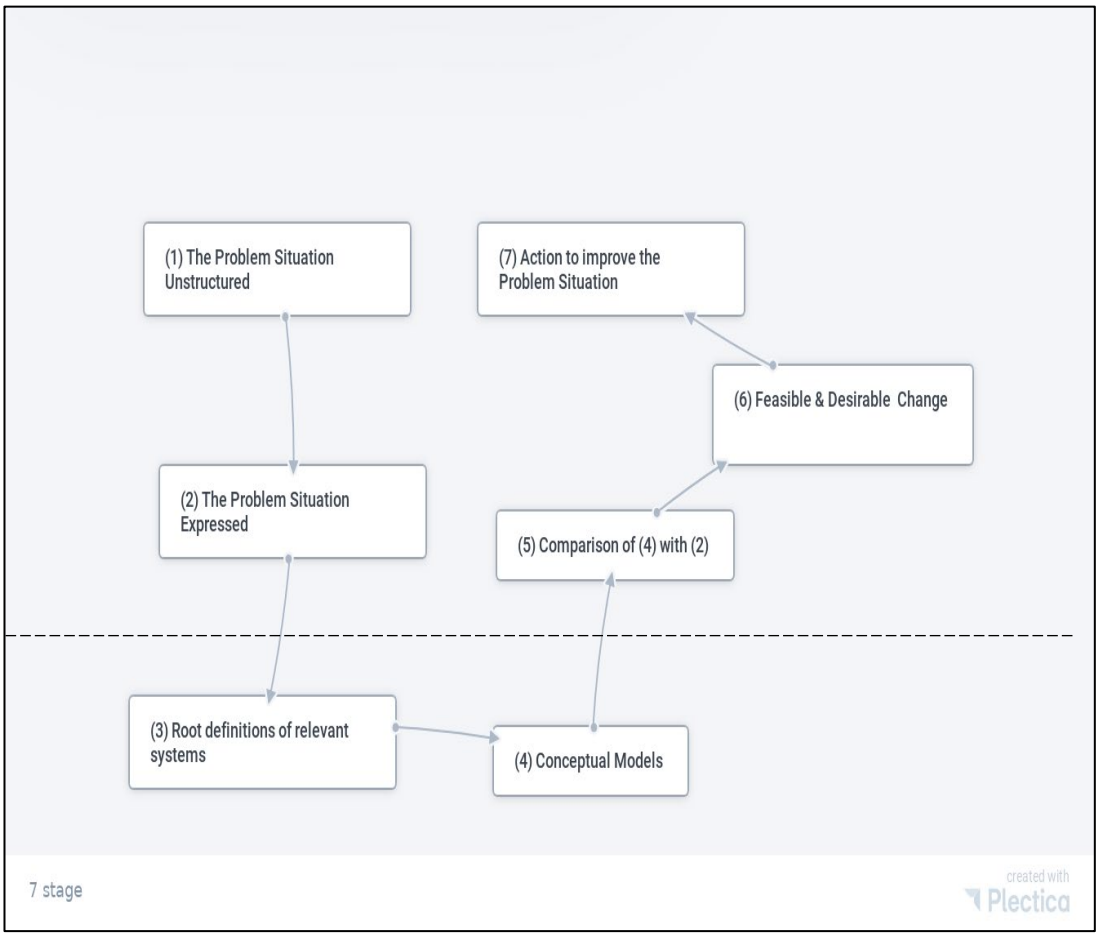
Appendix Figure 3: The environment of decision, adapted from Friend & Hickling, 2005

Because of the pressure, managers and decision makers face dilemmas: whether to be more synoptic or more focused (scope); whether to simplify or elaborate (complexity); whether to be more reactive or interactive (conflict); whether to reduce uncertainty or live with it (uncertainty); whether to be more decisive or exploratory (progress) (Friend & Hickling, 2005, p.6). Managers will resolve these dilemmas depending on the circumstances. Thus, if managers are in the choosing mode, they may decide to *elaborate* the range of comparison areas; at other times it may be more appropriate to simplify these to effect swifter progress. This is one of the many virtues of SCA in that it compels progress.

Further information on this method can be found here:

Appendix C Soft Systems Methodology

The easiest way to explain the methodology of SSM is through the seven phases of the methodological cycle, taking into account that experienced users can start from any point in the cycle, can reverse, or move forward, depending on the circumstances of the situation (see Appendix Figure 4).



Appendix Figure 4: The Seven-Stage SSM cycle after Checkland, 1984

Stage 1 Finding out – the problem situation is unstructured

The process of learning, or the process of enquiry that is SSM, begins when someone identifies a situation as being problematic and wants to do something about it. Checkland speaks of situations where individuals are “ill at ease about something” (Checkland, 1981). This notion emphasises that the problem is not easy to solve. An easy-to-solve problem will be well defined, highly structured; the objective will be clear and the way in which the problem is tackled, and its solution found, will be agreed upon in advance. These are known as *hard*

problems, and usually there is a high level of agreement about how the problem is *defined* (Wilson, 2001). In contrast *soft* problems are characterised by conflicting opinions. Those concerned about the problem situation will have multiple interpretations of how the problem is *defined* in the first place. Organisations face these problems every day. Typical *soft* problem situations might include: What is the best way to grow our business? What can we do to improve communication and coordination between our departments? What needs to be done to enable our organisation(s) to work well with current and future suppliers? The range of potential problems amenable to SSM is so vast because the process of learning and wanting to take action is so *general* and is the "core of being human" (Checkland & Poulter, 2006).

How do actual SSM studies begin? In the early days of the methodology – up until 1990 – an SSM study would begin when a client and an analyst (familiar with SSM), would agree to look at a problematic situation, much in the way an organisation commissions a consultant. Later on, for some users of SSM, the methodology was so "internalised" that it became habitual practice. This use of SSM is known as mode 2 usage and is discussed later.

Stage 2 – Expressing the problem situation

The use of rich pictures in expressing problem situations has become commonplace (Armson, 2011). Several examples of rich pictures can be found in the case study section of this thesis. They are cartoon-like drawings that depict various aspects of problem situations, incorporating elements of structure, important relationships, key processes, areas of conflict etc., all from multiple perspectives. Use of SSM is often understood as a group process, though it is not the case that groups are a pre-requisite (Checkland & Scholes, 1990; Midgley, 2000). Rough sketches and diagrams, attempting to express the situation, are encouraged throughout the learning cycle by groups or individuals. They are part of the "craft" of SSM (Checkland & Poulter, 2006). The technique is an effective means of engaging would-be problem solvers, with evidence that expressing problems in this way, rather than through words and text, helps groups and individuals to "stretch" and even "break" existing paradigmatic thought (McFadzean, 2000; Proctor, 2014). This potentially enhances SSM's credentials as a *creative* problem-solving approach.

The main argument for the use of rich pictures is to encourage those involved to adopt holistic, rather than reductionist thinking about their situation (Checkland,1999). On a suitably large canvas, participants can begin to understand and empathise with other perspectives on the problem situation and can also see links and relationships that are not easily discernible if the problem is merely expressed, as is convention, using linear prose.

The rich picture technique is a means of gathering data (Bell, Berg & Morse *,* 2019), it provides those involved a means of relatively free expression (depending on the skill of the facilitator) and it also has a role in summarising lengthy documents that may describe important concepts or ideas, ideas that are sometimes more easily communicated in pictures (Checkland 1999). That the technique has been extracted from the SSM learning cycle and used in other contexts is a rough measure of the relative success and adoption of this tool.

Stage 3 Defining Relevant Systems

The purpose of stage 3 and 4 is to build some conceptual models of purposeful activities which can subsequently be used to provide insight, through a process of questioning aspects of the problematical situation. Before any model can be built, however, a succinct and organised statement is required, setting out a definition of the activity system to be modelled. Known as a “root definition” (Checkland & Poulter, 2006), this normally takes the form of a system “do P, by Q in order to achieve R”.

This part of the methodology can, and perhaps should, feel liberating for the user. This is because a range of systems definitions can be formulated, each reflecting a particular viewpoint or worldview, and deemed to be relevant to the situation. Thus, a welfare benefit system for jobseekers could be described as ‘a system to support and encourage individuals seeking work”, or a ‘system to detect fraudulent claims’, or, more critically, “a system to humiliate vulnerable working-age adults’. Determining the *relevance* of candidate root definitions is a matter of judgement. No real guidance can be offered on this part of the methodology, though the injunction to consult stakeholders so that multiple views are considered is part of SSM’s constitution. Choices will also be required

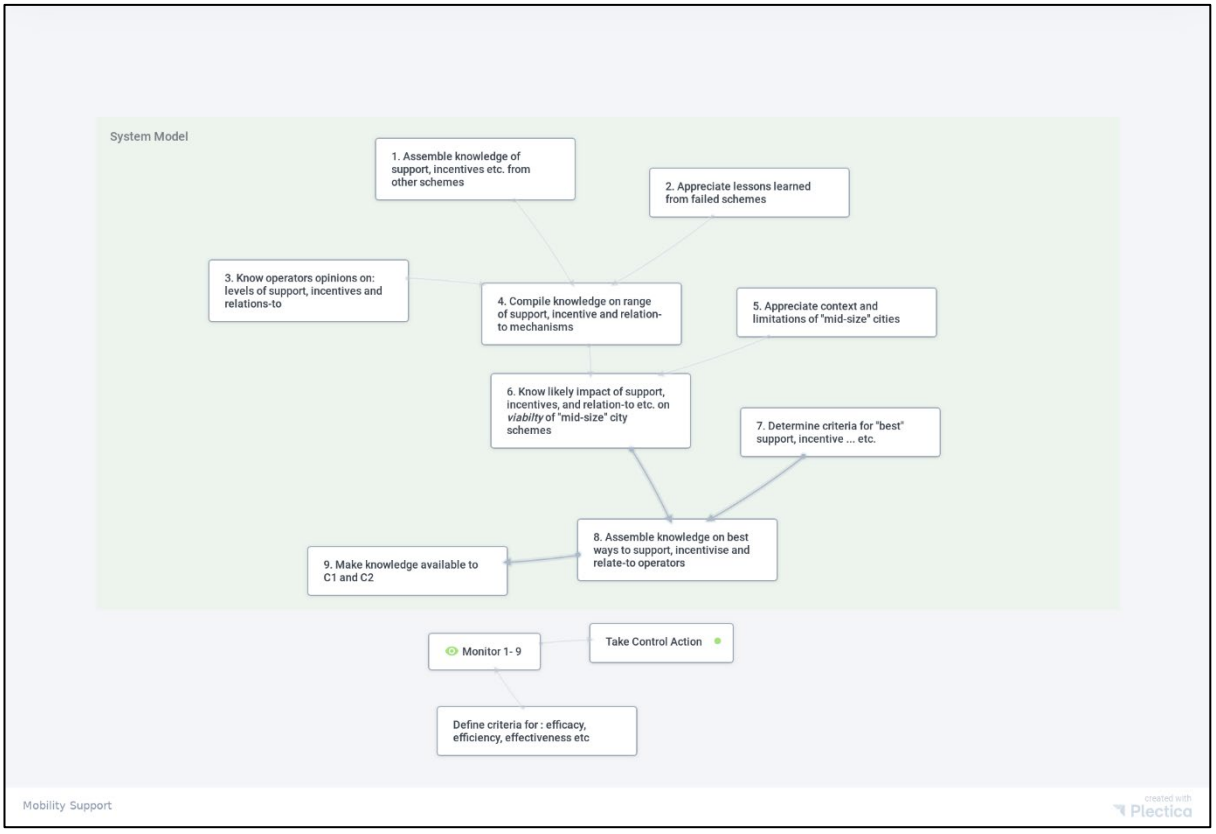
in terms of “system scale” and “system type” (Wilson and Van Haperen, 2016 plxviii). The former is a matter of personal preference for those involved, the latter a choice determined by context. The concept of a “primary task system” is introduced to describe those situations where the resultant model approximately maps on to an identifiable referent, for example an organisation or a department; an “issue-based” system by contrast goes beyond recognisable referents and their likely primary tasks, looking at issues that may be more “contentious” (Wilson & Van Haperen, 2016) and offering the prospects for more radical interventions.

The methodology provides substantial guidance on formulating rigorous root definitions. This includes the PQR formula which helps to provide shape to the statement; and the mnemonic CATWOE (the letters are explained below) which enriches the statement and makes important elements explicit. Every system definition should transform either material or abstract entities (depending on the situation) into entities of the same kind, but in a transformed state; and every systems definition must be based on an identifiable worldview. Customers, actors, owners and the environment account for the other elements of CATWOE and might be implicit in some systems definitions, but generally methodological guidance suggests that making these explicit helps with the thinking.

Stage 4 Building conceptual models of relevant systems

The second most important feature of the “below the line”, 7-stage methodology is building conceptual models of the relevant systems defined in stage 3. These models are at various times defined as “devices” (Checkland & Poulter, 2006); “notional systems” (Checkland, 1981); “holons” (Checkland & Scholes, 1990); “ideal types” (Checkland, 1981) and of course “conceptual models”. The models are simple word and arrow diagrams depicting the minimum activities required to accomplish the system defined in the root definition of a relevant system. Verbs in the imperative are used to capture the essence of the *human* activities that could be carried out in the real world. Relationships between activities, denoted by one directional arrows, are logical dependencies.

Conceptual models assemble the “minimum necessary activities” needed to accomplish or achieve the transformation specified in the root definition. As with the formulation of root definitions, there is plenty of guidance on how to create models from those very same root definitions. One essential aid is to think in terms of the input-transformation-output model (see for example Slack, Betts, Brandon-Jones & Johnstone, 2015 in relation to operations management). It is useful to think about how inputs are acquired, how these get transformed, and how they are made available as outputs to the customer or beneficiary of the system. Monitoring and controlling activities are also added to the model to emphasise that the activities in the system are capable of being monitored, with corrective action taken to control the system if it veers too far away from expected performance. An illustration is provided below in Appendix Figure 5:



Appendix Figure 5: Conceptual Systems Model Example from Author produced in Plectica software.

Both Checkland and Wilson advocate hand drawn models, even in their very latest accounts of SSM. This may seem outdated, but it helps to re-emphasise the point about “models-as-devices”. It differentiates SSM from diagramming techniques typically used in Business Process Re-Engineering (BPR) and hard

systems approaches. It is a visual reminder that the models are not descriptions of the world but are purely “logical machines”, that we can make use of to interrogate the problem situation, helping to create insight and provoke debate.

Conceptual models must be faithful to the named systems. They mutually reinforce each other. In the earliest accounts of SSM and indeed in some current accounts, it is emphasised that the relationship between RDs and conceptual models is one of being-doing. The RD says what the system *is,* and the conceptual model describes what the system *does*.

It is essential when building conceptual models to have a good understanding of the difference uses of *what(s)* and *how(s)* in SSM. Research on SSM has forensically studied how these words are used in the methodology (Mingers & Taylor, 1992; Checkland & Tsouvalis, 1996; Wilson & Van Haperen, 2016). A first meaning of the what/how distinction was highlighted by Minger’s (1990). Systems thinkers are (or should be) adept at moving between hierarchical levels, and this “is absolutely fundamental to systems thinking” Checkland (1999, p. A23). It is fundamental, conceptually, because it is one of the four basic characteristics of all “adaptive wholes” which comprise: communication processes; control processes; hierarchy; and emergent properties of the whole (Checkland & Poulter, 2006). Users of SSM are encouraged to think at three levels as a minimum: the level of the wider system; the level of the system; and the level of sub-systems. An example is provided below:

Wider System	A system to improve air quality in the city…
System	A system to create viable shared transport schemes…
Sub-system	A system to establish a bike sharing scheme…

A *what* at one level becomes a *how* from the perspective of the higher level. For example, creating shared transport schemes is one potential means of improving air quality. An alternative *how* could be to introduce congestion charging. A *how* at one level can become the *what* at the next lower level. Thus, we could take an activity from the model above (Appendix Figure 6), say, “know operators’ opinions on support, incentives etc*”.* This is a *how* at the system level but becomes a new *what* when we expand the activity with further detail and

model it as a subsystem. New *how(s)* would have to be imagined for the new *what* of “know operators’ opinions… etc.”. This *how* could be to conduct surveys of operators, or hold informal discussions with operators etc. The sub-system might be modelled, as in the case of its wider system. Users of SSM are encouraged to think in terms of *what, how and why*, with *what* equating to the system, *how* the sub-system and *why* the wider system. Users need to be comfortable moving up and down the levels, recognising the changing concept of what, how and why.

Refinement and development of stages 3 and 4 of the methodology has slowed over the last 20 years. Some new thinking for model building and use is in evidence, most notably Wilson and Van Haperen (2016). Wilson’s (2001) approach to modelling in SSM has always been different to Checkland’s and to Checkland and his co-authors. Checkland & Scholes (1990) recommend that most models should comprise a maximum of 7 +/- 2 activities based on Kelly’s (1968) suggestion that the human brain begins to struggle if it is asked to handle more than 5 to 9 concepts simultaneously. For this reason, Checkland’s models contain a manageable number of concepts, and if additional detail is required then an activity in the model can be expanded by becoming a *what* at a lower level of resolution. Wilson prefers to create vast, expansive models, some of which can have as many as 200 activities (Jackson, 2019). This better resembles the complexity of organisational life and showcases the richness of the models. More recently, Wilson & Van Haperen (2015) have taken their version of SSM in a very different direction to the one known by Checkland and his followers. This involves the use of generic models in comparison work. Generic models have been created for programme management, benefits realisation, ISO 9001 etc. Such is the ubiquity of these ideas in management, that Wilson & Van Haperen have felt it legitimate to radically depart from the general and long-standing assumption of SSM, that conceptual models should be *specific* to the problematical situation under investigation. These generic models are not “intended designs but are explicit aids to the thought process” (Wilson & Van Haperen 2015. p. lxxvi). It would appear that Wilson and Van Haperen are suggesting that they can meet the constitutive rules for “doing SSM”, using ideas that have more in common with systems engineering. (Jackson, 2019). But this is a long way from the original principle of recognising

that “real world knowledge does inform knowledge building, but, crucially, must not dominate it. (Checkland, 1999, A26).

Stage 5 Comparing models with the problem situation

In stage 5 of the methodology, the user compares a *what* and compares it to the *how* of the “real” situation. Taking each activity from the model in turn, users can ask how the activity is done (or not done) in the “real” world. Users of SSM must remember that the models created are “logical devices”, *not* representations of *how* things are done in the real world. This sets up a comparison. Having diligently named relevant systems and created conceptual models, users who reach this stage of SSM can now compare their models to the situation as it is perceived by those trying to manage it. Ledington & Ledington (1999, p.1149) consider this to be a “critical activity to both the theory and practice of applied systems thinking”. The comparison is often made by means of a matrix as illustrated below in Appendix Figure 6: An Example of a Comparison Table :

Activity	**Is it done now ?**	**Should it exist?**	**Who does it?**	**How is it judged?**	**Judgement of performance**	**Potential Changes**
1. Assemble Knowledge of support… etc.						
2. Appreciate lessons learned from failed schemes		`				
3. Know opinions of operators on support… etc.						
Etc						
Link 1, 2 and 3 to 4 etc.						

Appendix Figure 6: An Example of a Comparison Table for SSM

There are numerous ways in which the comparison can be performed (Checkland, 1981). The most common method is by a means of formal questioning, where the models are used as “a source of questions to ask of the real world” (Checkland & Scholes, 1990). In the case of issue-based models, where the model does not easily map on to a recognisable aspect of the real-world, the activities would be compared to the *expectations* of the people involved in the situation. These would be expectations about what *could* exist. Several SSM studies refer to past events. Here, the modelled activities are compared to the *recollections* of how past events occurred, with the intent of trying to learn about what went wrong. This demonstrates the range of use SSM can be put to.

Having observed practical use of the methodology over 15-20 years, it was recognised that different users could derive different conceptual models from the same root definition (Mingers, 1990). This had the effect of relaxing the bond that was required when building models from root definitions, so long as they were “defensible” (Mingers, 1990; Wilson 2001). Conceptual models could therefore be viewed as “conceptual *how(s)*” and compared to the “actual *how”* of the situation (Mingers 1990).

The comparison stage can be looked upon as a relatively easy-to-understand part of the methodology. But appearances are deceptive, and the comparison stage is often “subtle” and “sophisticated”, and as a result is “poorly understood” (Davis & Ledington, 1991 p. 1155). The usefulness of the models or their “importance” can only be judged during or after comparison is completed (Ledington & Ledington, 1991 p. 1155). This means that one can begin optimistically with what is perceived to be a *promising* model but then change to a different line of inquiry, depending on the reception received by those doing the comparison. Ledington & Ledington (1999) therefore suggest a much broader range of comparison experiences than Checkland and Wilson allude to. Some models are “enjoyed”; some “hated” (Ledington & Ledington, 1999, p.1155). Checkland & Poulter (2006) respond to this criticism with the injunction for the analyst/consultant to be “light-footed”, able to make quick judgements, switch to alternative models, jump to different questions. Wilson & Van Haperen

(2015) respond by suggesting that despite the acknowledged “vagueness” of the comparison process, “there is little evidence of the specific impact on the quality of the outcomes” (Wilson & Van Haperen, 2016, p. lxxvi).

Stages 6 and 7 Deciding on systemically desirable and culturally feasible change and taking action to improve the situation.

The result of making comparisons between the models and the actual situation, will hopefully change perceptions and create new insights for those involved. For the creators of SSM, especially Checkland, users are more likely to adjust their “appreciative settings”, following the concept of appreciation (Vickers, 1965). Making comparisons also inevitably leads to debate about what can be changed. In all SSM studies there will be debates about *what(s)* and *how(s)* – just as there is in every day human experience, but the key point is that this will, hopefully, be *organised* debate. It will address Checkland’s often made remark – his “meta-position” on problem solving – about people “thrashing around”.

Given the flexibility of the methodology and the wide-ranging nature of discussions that will take place the outcomes of using SSM are understandably generic. It is often the case, according to Checkland (1999), that “action to improve the situation” will include structural, processual or attitudinal change. Checkland avoids using the word “consensus” to describe the outcomes of debates, believing this to be unlikely. He prefers the word accommodation. Users and participants in the process generally shift their perceptions gradually, and agree actions that appear to be desirable and feasible.

When actions to improve the situation are agreed the methodology comes full circle. The new actions will be monitored, and new perceptions of problems will emerge. The learning cycle begins again.

Further information on this method can be found here:

Checkland, P., & Poulter, J. (2006). *Learning for action : A short definitive account of soft systems methodology, and its use for practitioner, teachers and students*. Chichester, England: John Wiley

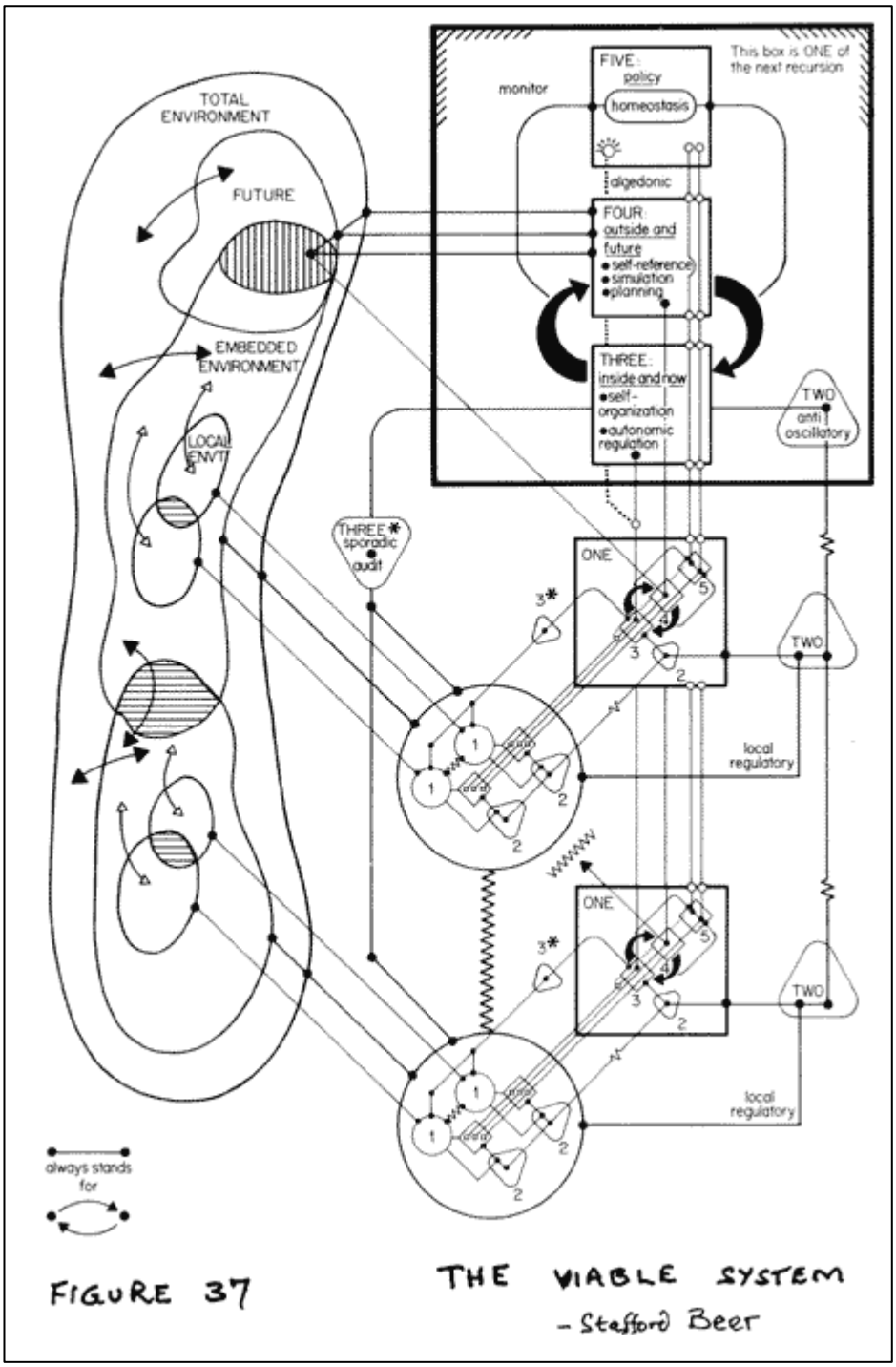
Appendix D The Viable Systems Model (VSM)

The Viable Systems Model (VSM) was created in the 1970s by Stafford Beer and documented in three key publications: *Brain of the Firm* (1972), *The Heart of Enterprise* (1979) and *Diagnosing the System* (1985). The origins of the VSM can be traced back to Beer's involvement in running an operations research team in a Sheffield steel mill in the 1950s, and in his more famous and ill-fated intervention in Chile, where he attempted to help to run the Chilean economy using cybernetic principles (Pickering, 2011). Even though the ideas that shaped the VSM are of a certain vintage, their sticking power is evident today both in academia, with a steady flow of articles published in specialist fields (for example, Harwood (2012); Achterbergh and Vries (2002), Preece & Shaw (2019)); and in specialist consulting practice, with organisations like Malik Management (Jackson, 2019 p.299; Malik, 2020).

Beer was an assured operations researcher working on issues of production and manufacturing, but during the late 1950s his attention shifted decisively to understanding "exceedingly complex systems" (Beer, 1959). Such systems are not fully describable or knowable in the way that production problems are in O.R., such systems are not "adequately predictable", they are always "becoming something new" (Pickering, 2010 p.237). As Pickering (2010, p. 223) explains, "exceedingly complex systems [are] … in a different ontological space from the referents of O.R…". In order to make progress with understanding such systems Beer turned to cybernetics (Ashby's theory of regulation; his law of requisite variety; principles of feedback control; "black box" techniques etc.) and drew inspiration from "naturally occurring systems" (Jackson, 2019); systems that were known to be capable of adaptation, performance and survival. In the end, Beer chose the human nervous system, an "exemplary viable system", to fully develop what became known as the VSM.

The VSM as a model is the embodiment of the core systems ideas that were referred to above. It is a perfectly general model, applying to all "known to be viable" systems. Viable systems are systems that must obey cybernetic laws. Failure to do so (adequately) leads to impairment or death (non-viability).

The model itself comprises five sub-systems labelled S1 to S5, as indicated in the diagram below.



Appendix Figure 7: The Viable Systems Model. Source: Cwarel Isaf Institute (2002)

The best way of unravelling the model is to begin at system one (S1), known as the operational level or primary activities (Beer describes it as "implementation"). In the diagram above there are two such operations. They are both represented with identical diagrammatic conventions: each has a circle, representing the operation; each a square box, representing the management of the operation; and there are connecting arrows between the

management and the operation, and the operation and the environment. Zig-zagged arrows represent the attenuation of variety; arrows with a triangle represent amplification of variety. This is a first manifestation of Ashby's (1957) law that "only variety can absorb variety". Variety measures the number of possible states of a system. In this context the variety of the environment swamps operational variety, and operational variety easily overwhelms management's variety. For there to be a balance, larger variety objects must be attenuated, and lower variety systems must be amplified.

For the human body, an S1 operation could be the system that manages the heart, or the system that manages the lungs etc. In the context of organisations an S1 operation could be a subsidiary of a company. A system one referent, in principle, could be "hived off", and is practically capable of maintaining its own existence. Operations directly contribute to the purposes of the whole. This leads to one of the key findings of Beer's work in highly complex systems. In order for whole systems to survive and to have requisite control, that control must be distributed throughout the system. Local management must respond to the variety it faces from its operations, and similarly local operations must manage the variety it faces from its environment. In the human body, the heart largely controls itself, "it adapts to the conditions it finds itself in by reflex action largely mediated somewhere down the spinal column" (Pickering, 2010, p. 245), it does not need to seek out permission by going to higher levels of the brain. The same principle is true of social organisations according to Beer; a subsidiary or division of a firm must be left to control its own relationships with its operation and its environment without unnecessary interference by the corporate whole. At the same time, there must be some central direction if the whole is to remain coherent and not fall apart. This is another balancing act, a well-known dilemma for managers who must design their organisations in a centralised or decentralised fashion. The VSM provides a language for managers to explore this question, and to do so in accordance with cybernetic principles. In fact, the very design and arrangement of multiple S1s is an exercise in variety management because it is a means for the corporate whole to deal with its variety imbalance. By assigning different responsibilities to each of its S1s it avoids being overwhelmed by variety. One final remark is required to complete the description of the S1 sub-system. In the diagram above

interactions or communications between S1 operations are depicted by wavy lines. Information that has come to light in say S1B might be considered useful to S1A. For example, S1B might have knowledge that a material or some information that is required by S1A is not available. S1B may communicate this information to S1A informally, thinking it will help S1A to manage its performance. Organisations have developed various ways of informally communicating potentially valuable information – for example colleagues comparing notes over a desk, a chance meeting in a corridor or a water cooler moment. All these mechanisms help to underpin viability and acceptable performance.

System 2 is a coordinating function. Its specialist role is to “damp the oscillations” that can occur between S1 functions which use the same resources. Multiple S1 elements may want access to the same clients, for example. A Customer Relationship Management (CRM) system may help coordinate access.

System 3 is the control function. System 1 elements are *focused* on their goals but there must be a function that ensures the cohesion of the primary S1 activities. The S3 function takes a *synoptic* view of the “here and now”. It works with the known goals of the viable whole (often called the “system in focus” (SIF)) and translates these into suitable goals for the S1 activities. It also monitors the performance of S1 units by receiving management reports. Management reports can be manipulated or may be flawed, and so there is the option for S3 to have an audit function (called S3*) which can audit the operations directly, effectively by-passing the S1 management. S3’s role is to bargain with the S1 elements who compete with each other for available resources. S3 will determine resource allocation between S1 elements based on how the allocation contributes to the purpose of the whole. S3 also controls the coordination efforts of the previously mentioned S2 function.

A well-functioning S3 accumulates considerable knowledge about the set of primary activities, their performance, problems they face and their propensity to change. This makes it a good place to judge the *feasibility* of any new proposals advanced by S4, known as “intelligence”. In contrast to S3, S4 focuses on the “outside” and “then”. The system whole must be capable of adapting to its

environment. The environment that S4 faces is of a different scale to the environments that affect its S1 primary operations; it envelops these smaller environments. S4 scans the environment for new regulations, new technologies, competitive developments etc. which may affect the viability of the SIF. It devises a response to these developments, creating plans to mitigate threats and new proposals to exploit opportunities. S4 can also help to shape aspects of the environment – for example, influence the agenda – in order to increase the chances of making conditions for the future more agreeable to viability. S4 should contain plenty of representations of the future, and of itself, and be able to run simulations and what-if scenarios. Beer envisaged an “operations room” where senior managers would meet. This would become an “environment for decision” (Beer, quoted in Jackson, 2019). The link between system 3 and 4 is noteworthy, pointing to a somewhat antagonistic relationship. Because S3 has deep knowledge of the performance, capabilities and limitations of the primary activities, it is well positioned to assess the feasibility of any proposals put forward by S4. It has the right to veto these proposals if it thinks that change is not feasible. The proposals have to be re-worked at S4, accommodations made and re-submitted to S3. Finally, S5 is described as the policy function. System 5 moderates the relationship between (S3) which prefers stability and (S4) innovation, which desires change. It sets the *identity* of the system-in-focus and has a duty to represent this identity to the wider system of which it is a part, anticipating the concept of recursion (see below). In effect system 5 sets the vision and answers the strategic question “what business are we in?”. If the identity of the system fundamentally changes then this must be communicated to system 1. New primary activities might be conceived or acquired; former ones abandoned.

Beer argues that all viable systems have a recursive nature. This means that the system-in-focus will be part of a wider system, which itself has 5 functional sub-systems. In the diagram above an embedded system is depicted in the system-in-focus, angled at 45 degrees to the margin. This sub-system also has functions 2 to 5 embodied in its “management box”, with S1 elements visible in its operations. This means that we can apply the same organisational logic to different structural levels and run the same diagnostic analysis at multiple levels

of recursion. Recursion helps managers to simplify and manage highly complex systems (Espejo, 2017, quoted in Jackson, 2019).

The VSM methodology involves a mapping of the organisation(s) under investigation on to the VSM model. This gives rise to two modes of application. Mode 1 is used *diagnostically* with an existing organisation under the microscope; mode 2 is for circumstances where the *design* of a new organisation is proposed. Where an organisation decides to pursue a radically different purpose than the one that is currently the case, the tone of any intervention will shift from diagnosis to design. The process of using the VSM is best understood in three phases. First there is a thorough investigation of the purpose and identity of the organisation (or enterprise) to be modelled. Beer (1979) insists that this is "observer dependent", but that a "convention" can be agreed amongst those involved about what the organisation's main purpose is. Espejo, Bowling & Hoverstadt (1999) use the concepts of "theories in use" and "espoused theories" to make distinctions about what an organisation actually *does,* how it produces itself, how it transforms inputs into outputs. The result is a "rich description" of the identity of the organisation, something that is broadly agreed by internal and external stakeholders

The second phase is called the "unfolding of complexity". It asks how the organisation structures itself to deliver the purpose identified at its various levels of recursion. So, in the case of a local authority, various chunks of massive complexity are managed by units like Children Services, Adult Services, Regeneration, Environmental Services etc. These units are readily identifiable because they have defined tasks, they are assigned resources and have some managerial capacity (Espinosa and Walker, 2011 quoted in Jackson, 2019). The same logic can be applied in all interventions to identify the primary activities referred to above as S1. When an organisation asks, "what business are we in?" and the answer is marketing, finance, HR or sales then it is legitimate, according to the VSM, to make these primary activities, because this is what the organisation does; it creates marketing solutions, it provides financial advice etc. But in most cases, finance, HR etc. are not the *raison d'etre* of the organisation, they are supporting activities. The VSM then, is very much in tune with an operations perspective on organisations, as an input-transformation-output entity, producing goods and services. How ever the

primary activities are defined, they must be given the maximum autonomy possible to manage their own complexity relations, within the bounds of systemic cohesion of the whole. This phase is perhaps the hardest and “most creative” (Jackson, 2019) part of the VSM because one has to identify the key drivers of the “dimensions” under which the organisation “unfolds” its complexity.

Once a model of the enterprise has been created and levels of recursion agreed, phase 3 can commence. This is effectively diagnosing the system to look at such things as the constraints imposed on system 1 activities and whether these serve viability. Whether system 2 is effective in coordination? How does system 3 perform its audit function? How are resource bargains determined by S3? What activities make up system 4? Does system 5 convey clear purposes to system 1? The range of diagnostic questions is considerable, and more detail can be found in numerous guides including Beer (1985) and Jackson (2003).

Fifty or more years on from when details of the VSM began to emerge the ideas still generate interest in research and in practice. “Variants of the VSM are still practiced and taught today” (Pickering, 2010, p. 244). Recent developments have seen the VSM combined with the idea of organisations conducting “social experiments” in order to pursue an idea of “rich survival” (Achterbergh & Vriens, 2010a); further developments of the “Viplan method” (Espejo and Reyes, 2011); use of the Viplan method to help with the management of change (Harwood, 2012); links between the VSM and sustainability (Espinosa and Walker, 2017); links between the VSM and “viable knowledge” (Achterbergh and Vriens, 2002) and using the VSM in disaster preparedness reviews (Preece & Shaw, 2020). Espejo in particular has developed the methodology over the years, creating what is known as the “Viplan method” (Espejo & Bowling, 1999; Espejo and Reyes, 2011). In its latest incarnation (Espejo and Reyes, 2011) two inquiring loops feed from each other. One is a cybernetic loop which questions whether the structure of a situation impairs effective human relationships; the second is a learning loop, which makes organisational change more likely, because more favourable conditions have been created for the people involved in, and affected by, the situation. This takes the VSM in new directions, seeking to

combine elements of interpretive approaches like SSM with the structural and functionalist feel of the VSM.

But overall there is a lack of sufficient evidence to support any claim that the VSM is widely used in practice. The VSM is not mentioned at all in Ranyard, Fildes & Hu's (2014) "Reassessing the Scope of OR Practice". Beer's ideas on the VSM and Team Syntegrity appear to be a cornerstone of Malik Management practice (Jackson 2019), but many would conclude that this is a bespoke consultancy, a very special case. It would therefore be very hard to suggest that the ideas about the VSM have become well established in practice.

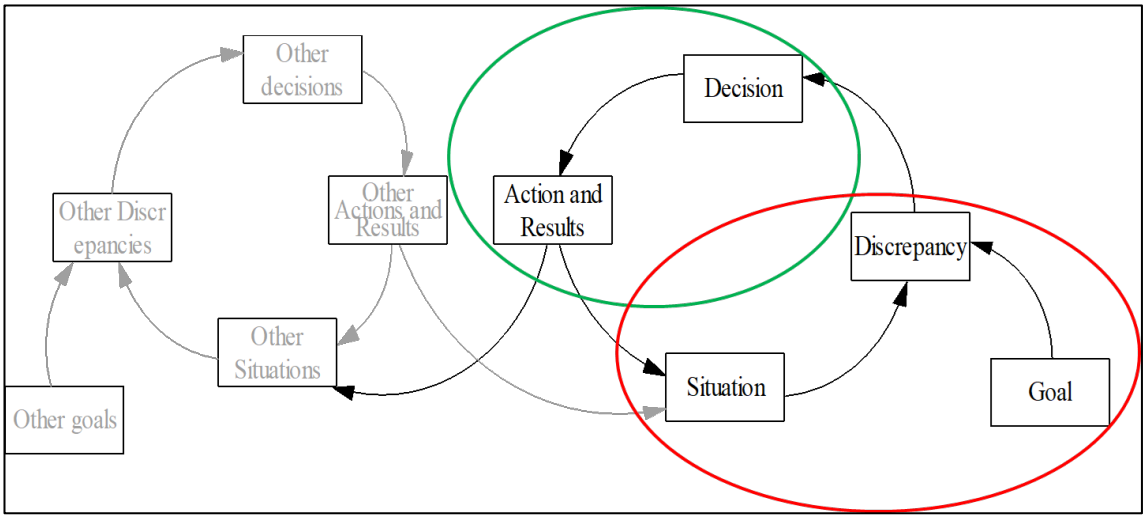
Further information on this method can be found here:

Espejo, R., & Reyes, A. (2011). ***Organizational systems: Managing complexity with the viable system model*** **Springer Science & Business Media**

Appendix E Systems Dynamics (SD) – Causal Loop Diagrams (CLDs)

The origin of Systems Dynamics dates back to the 1950s when the Massachusetts Institute of Technology (MIT), and Jay Forrester in particular, began to apply feedback thinking to numerous applications (Richardson, 1991). The main idea was that system behaviour was a result of multiple variables causally related in dynamic feedback loops. The approach was most famously applied to address the "global system" (population growth, industrialisation, food production, use of non-renewable resources etc.) in *The Limits to Growth* (Meadows, Randers & Meadows, 1972). It is not the intention here to discuss systems dynamics methodology in any great depth, because the full methodology cannot reasonably be contemplated as a "freely given take-away" for managers to run with. It would be more reasonable to assume that expertise is required to run and interpret the computer simulations that, for some (for example, Warren, 2004), are essential. However, there are "softer" versions of SD and many make use one of the key tools from the wider methodology: Causal loop diagrams (CLD).

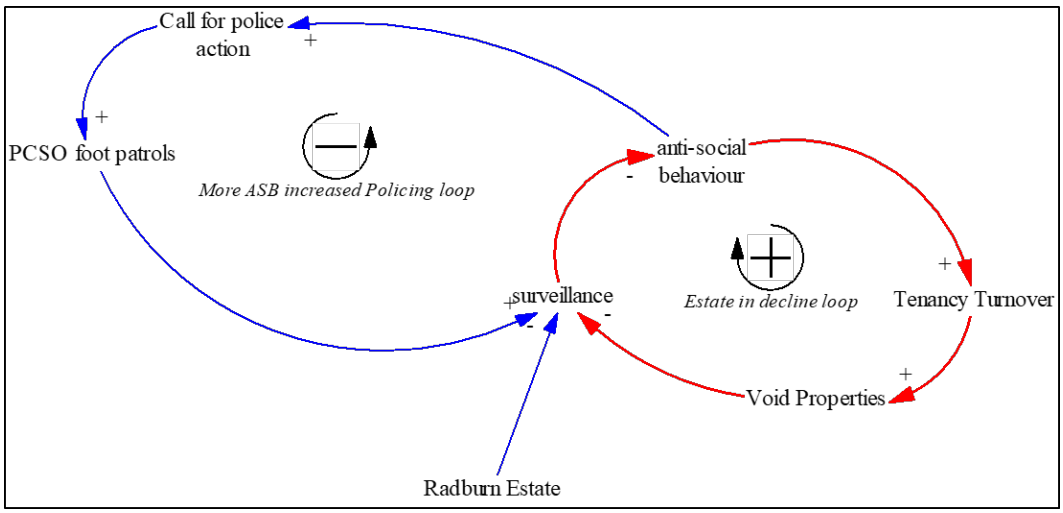
A key feature of systems dynamics is to make a distinction between "event-oriented" thinking and "feedback-based thinking" (Sterman, 2000; Morecroft, 2015). Most of us are prone to the former way of thinking, seeking quick remedies to perceived problems, identifying simple causes and effects. If on employs feedback thinking, one begins to see a much more complex chain of causes and effects which have the tendency to loop. The theory is illustrated below in Appendix Figure 9.



Appendix Figure 8: Adapted from Morecroft, John D. W. *Strategic Modelling and Business Dynamics: a Feedback Systems Approach*. John Wiley & Sons, 2014.

On the right-hand side of figure 2.7 an implicit endogenous goal is recognised resulting in a discrepancy, a decision is made and the situation changes, reducing the discrepancy between the goal and the actual. But the action (produced on the right-hand side) affects other situations. These are shown in grey on the left-hand side of the figure. These “other situations” also have their own goal/discrepancy logic, and actions taken here can also affect the right-hand side situation. Thinking in this way begins to reveal multiple variables, causally related in dynamic feedback loops.

This way of thinking can be captured in one of SD’s qualitative tools: Causal loop diagrams (CLD). Construction of the diagrams is relatively easy and can be used by managers to share and discuss “mental models” of the situations they face. An example is provided below in Appendix Figure 9:



Appendix Figure 9: Causal loop diagram example

This example is taken from my own practice in the regeneration sector. It shows a fragment of causal loops that depict a mental model related to run-down neighbourhoods. The UK has a high number of so-called “Radburn” estates that were developed in the 1960s. The main principle of Radburn designed estates is to separate motor vehicles from dwellings with the aim of making life safer and quieter for residents. Busy roads were designed to circumnavigate these estates. But the design had an unintended consequence because it reduced surveillance. Residents had less opportunity to “keep an eye on things” and thereby prevent anti-social behaviour. And if some members of the community had more reason to be anti-social then they could be so, knowing that their behaviour was less likely to be seen. These causes and effects are depicted in the diagram above. If an increase in the quantity of the concept (or variable) at the tail of an arrow is increased, its impact on the concept (or variable) at the head of an arrow is recorded with a +/- link polarity. A positive increase indicates that the concept at the head of the arrow moves in the same direction as the concept at the tail of the arrow. A negative sign indicates the opposite. Causes and effects are traced in feedback loops, giving rise to loop polarity. In the example above the loop on the right (shaded red) is a reinforcing loop. Unchecked the feedback loop will result in exponential growth. In this case a vicious cycle is evident because anti-social behaviour results in tenancy turnover further reducing opportunities for surveillance. The loop is labelled “Estate in decline”. Such loops cannot continue for ever without some effect or

intervention elsewhere. This is identified on the left-hand side (shaded blue), where a balancing loop helps to increase surveillance.

More expansive diagrams can be used to communicate mental models, identify dominant loops, the loops which appear to be influencing behaviour, and help to generate ideas for policy and intervention.

One of the most celebrated and high-level SD interventions made recently in the UK was a review of the child protection system in England (Munro, 2010; Lane, 2016). The protection system had undergone many reforms over several years with well-intentioned managers creating a framework to ensure compliance. But the reforms became overly prescriptive for child protection workers, creating a culture of “following the rules” rather than exercising professional judgement. Lane, Munro & Husemann’s (2016) diagrams could show how several causal loops reinforced this compliance culture, creating unintended side-effects. SD was the main methodology used in the study commissioned by the Department of Education and led to several of its recommendations. It is noteworthy for two reasons. First, the head of the review (Munro) wanted to take a “holistic approach” to understanding the child protection system; and secondly, only CLDs were thought necessary – no computer simulations were constructed.

Further information on this method can be found here:

Morecroft, J. D. (2015). Strategic modelling and business dynamics: A feedback systems approach John Wiley & Sons.

Appendix F Critical Systems Heuristics

CSH was created by Werner Ulrich in 1983. As a systems theorist, he developed Churchman's ideas about inquiring systems and, as a practitioner, he is concerned with issues of public policy, planning, evaluation research, health, poverty etc. These interests did not lead him to the kind of expert-driven large-scale modelling described earlier and preferred by some advocates of the systems approach (e.g., systems dynamics). Instead, he focuses on the boundaries of problem situations and the boundaries implied by any such systems design that would seek to address these situations. He asks how are these boundaries rationally justified? Ulrich is concerned about how we can systematically *reflect* on these judgements. We can (if we choose to) reflect on our own judgements as part of professional practice and we can reflect on the boundary choices made by others. Furthermore, boundary judgements can be revised as we take into account "previously neglected circumstances that in some way matter to us" (Ulrich & Reynolds, 2010, p.263). This happens in day-to-day life. The task is to make boundary critique more conscious and systematic, and this can be achieved by means of a methodology: critical systems heuristics (CSH).

The theory of CSH is supported by Ulrich's idea of a "reference system". Jackson (2019) likens this to the concept of *weltanshaungen* (in Churchman, and Checkland) and "appreciation" (in Vickers, 1995). Reference systems are therefore ways of seeing the world, lenses on the world, highlighting some aspects, blurring, or hiding others. A practical proposition, a systems design or a plan to do something is based on some observations of facts and norms ("valuations") that appear to be relevant. Other facts and norms are ignored or "concealed". Reference systems are conditioned by "human intentionality" (Ulrich, 2003). When we ask questions such as whose interests are served by the proposition/systems design, and what will count as improvement of the situation, we can begin to understand some of that intentionality. Ulrich (2003) likes to explain this as a triangle, the three points comprising boundary judgements about the 'system of concern', empirical facts deemed to be relevant, and evaluations (values) also deemed to be relevant. Each point of the triangle might be examined in light of the other two. For example, if the boundaries of the system are expanded to include the views of new

stakeholders, what new facts will emerge? Similarly, if we alter value judgements, what new facts become relevant? The interdependencies between facts, values and boundary judgements determine the reference system. Of course, there can be multiple reference systems, and an outcome of CSH is to reveal similarities and tensions between different reference systems.
Before explaining Ulrich's methodology further, some clarification of terminology is in order. He employs several terms to describe what we have until now called *problematical situations*. Instead of this, he prefers the "context of application" (Ulrich, 1996). The implication being that we may wish to widen the context or, less likely, narrow it, depending on the circumstances. But he also uses phrases like "situation"; "social systems design"; "plan"; and "systems design" etc. He does not mean an objectively identifiable system, plan or situation in the real world. We only have perceptions of these things. The terms are sometimes used interchangeably but Ulrich ultimately sees them operating at different levels of abstraction. "Situation" and "System Design" are on a continuum of "proximity to reality" with the former being closer to "reality" than the latter, though we can never know reality in an objective sense (Ulrich & Reynolds, 2010, p.251). For the purpose of explication, I will use the phrase "systems design". Depending on the context, the reader can also assume that this can mean "situation of concern", "plan" etc.

CSH can be used in two modes. First, it can be used to *evaluate* the success or otherwise of a systems design. Those involved in the design of the system ask critical questions about its success or otherwise. The same is true of those *affected* by the system design. In the second mode of usage, CSH complements other methodologies (a systems methodology or any other problem-solving approach for that matter) and critically reflects on the boundary judgements that are assumed by the methodology during its application.

CSH uses a set of 12 categories to help reveal the everyday judgements that enter systems designs. These 12 categories are inspired by thinking handed down by Churchman and Kant about *a priori* concepts (Ulrich, 1983) that are, in this context, necessary conditions for thinking about purposeful systems. When conceived in this way there is necessity for "sources of motivation" to explain the sense of purpose of the system design. Who is served by the system? Who

benefits? There is a need for “sources of control”, to understand the necessary power and resources of the system design and who makes decisions. There is a requirement for “sources of knowledge” which can explain the rationale for the system design and the expertise that offers some form of guarantee that the design is right technically and normatively. And finally, there are “sources of legitimation”, which confer (or not) legitimacy on the system, setting out who “witnesses” the system design. Three questions may be asked within each of these four groups (the sources of influence) to reveal the selectivity built into a systems design. Good design, Ulrich asserts, is to reveal these assumptions. The 12 categories are usually presented as questions and are set out below in Appendix Table 1 using the “ought” description only. When using CSH, questions can be asked in an “ideal mapping” exercise (the “ought” mode, as presented below) and in an “actual mapping” exercise (the “is” mode, substituting “is” and “are” for ought, below).

Sources of Influence	Questions (ought/is)	Social Role (Stakeholder)	Specific Concern (Stakes)	Key Problems (Stakeholder Issues)	Question Sequence
Sources of Motivation for the System Design	(2) What ought to be the purpose of the SD?		Purpose		2
	(1) Who ought to be the beneficiary of the system design (SD)?	Client (beneficiary)			1
	(3) What ought to be SD's measure of success?			Measure of Improvement	3
Sources of Control	(5) What conditions of success ought to be under the control of the SD?		Resources		5
	(4) Who ought to be in control of the conditions of success of SD?	Decision Maker			4
	(6) What conditions of success ought to be outside the control of the decision maker?			Decision Environment	6
Sources of Knowledge	(8) What ought to be relevant new knowledge and skills for SD?		Expertise		
	(7) Who ought to be providing relevant knowledge and skills for SD?	Expert			7
	(9) What ought to be regarded as assurances of successful implementation?			Guarantor	
Sources of Legitimacy	(11) What ought to be the opportunities for the interests of those negatively affected to have expression and freedom from the worldview of SD?		Emancipation		
	(10) Who ought to be representing the interests of those negatively affected by but not involved with SD?	Witness			
	(12) What space ought to be available for reconciling different worldviews regarding			Worldview	

Sources of Influence	Questions (ought/is)	Social Role (Stakeholder)	Specific Concern (Stakes)	Key Problems (Stakeholder Issues)	Question Sequence
	SD among those involved and affected?				

Appendix Table 1: Heuristic Questions adapted from Reynolds & Ulrich 2011

Having set out the boundary questions, attention is turned to how these are used in practice. Many applications begin with an "ideal mapping" exercise (Ulrich & Reynolds, 2010). Reynolds (1998), for example, as an evaluator of participatory planning efforts for rural development in Botswana questions his own reference system before working with stakeholder groups to map the "is" analysis. Midgley et al (1998), in developing housing services for older people, use CSH in tandem with other methodologies to get various stakeholder groups to identify an "ideal housing service". Some of the CSH questions are re-worded to make the questions more accessible. The authors find, to their surprise, that there is a good deal of consistency among the ideal designs proposed by different groups. The "properties" of the ideal housing system are listed and compared to the perceived situation. The ideal or "ought" mode is also used by those seeking to emancipate perspectives or knowledge that have been obscured or concealed by dominant planners. One way of resisting a planner's-imposed boundaries is to assert a different set of boundaries based on what ought to be the case as seen through the eyes of the affected. These new boundaries reflect a different reference system and are used with critical intent against the planners. The planners are compelled to defend their own boundary judgements. They cannot justify them on the basis of expertise because these are *judgements* and therefore have the same status in argument as the boundary claims of the affected. Buckle-Henning (2006) provide a gendered boundary critique of the Project Management Institute's (PMI) Project Managers Body of Knowledge (PMBOK). The body of knowledge excludes many forms of "feminine cognition and behaviour". If the system of knowledge is opened to multiple gendered experience it would "broaden the boundaries of recommended project management practice" (Buckle-Henning, 2006, p.11). Applications of CSH that start with "actual mapping" in the "is" mode tend to be the work of reflective practitioners. Donaires (2006) provides an example of

applying CSH to software development, exploring what is the case first and then asking what ought to be the case. Asking questions in the “ought” mode revealed the selectivity of current software development in a large IS development team. The final ‘variation’ of deploying the questions is to use them dialogically, or in debate, usually in workshop settings. These variations in mode are a moot point. Midgley (1997) and Jackson (2019) question the need for “actual mapping” in the “is mode”. Because Ulrich insists that there is no objectively “correct” demarcation of a boundary, Midgley and Jackson see little point in trying to discover one, and think it better to compare different “oughts” in dialogue.

Further information on this method can be found here:

Ulrich, W., & Reynolds, M. (2010). Critical systems heuristics. In Reynolds Martin, & Holwell Sue (Eds.), Systems approaches to managing change: A practical guide (pp. 243-292). London, UK: Springer.

Appendix G Invitation to Prospective Organisations

AN INVITATION TO TAKE PART IN MANAGEMENT RESEARCH

Introduction

I am a senior lecturer and researcher at Sheffield Business School, UK. I am currently undertaking a study to find out how, why and when managers and management teams use recognised problem structuring techniques to tackle pressing issues, and I am keen to meet organisations and management teams who might be interested in taking part in my research.

If you - or someone you know - has a complex, strategic, organisational problem characterised by many inter-connected issues, unclear goals, and little or no consensus on what to do, I would welcome the opportunity to talk to you.

About you

You will be a senior manager, or be part of a management team, beset by a difficult organisational problem that might benefit from an outside perspective. For example, you might be responsible for creating or designing a new strategy, a new service or new business function. You may want to address a new organisational priority or purpose. Your issue is multi-faceted with numerous stakeholders, many of whom have different perspectives. There is significant uncertainty and it may be difficult to develop a coherent plan. You want to tackle the issue and you might well be curious about understanding and applying new and different approaches to help alleviate the problem and improve the situation. You might also be short of time and would welcome an outsider's perspective and involvement. You may be a public, private or not-for-profit organisation or you may be part of a multiple organisational venture. What is most important is the nature of the problem situation you face. It must be complex, strategic, inter-connected etc.

Researcher

If you are interested in taking part in this research, I would be responsible for designing and proposing a suitable approach to address your issue, subject to your agreement. I would be responsible for facilitating the investigation (the consultancy study) and would write a report for your consideration. There would be NO FEE for the work undertaken, only an expectation that you and others in your team are able and willing to discuss complex problem solving in your organisation (via interviews). Anonymity and confidentiality will be assured at all times and will be subject to the university's research ethics policy which will be agreed before taking part in the research. More details on the research project can be found below.

Contact
If you are interested in taking part in this research or would like to know more please contact:

Michael Charlton BA, MBA, FHEA
Senior Lecturer - Business Systems
Telephone: +44 (0)114 225 2833 | Email: m.charlton@shu.ac.uk
About the Researcher

Michael Charlton is a Senior Lecturer at Sheffield Business School (SBS) where he teaches a range of business-related subjects to undergraduates, postgraduates and professionals in executive education. His particular interest is in applied systems thinking and the development of problem structuring methods (PSMs) to help individuals and groups of managers to tackle messy, complex projects. He has experience of using a range of systems methods in the private, public and not-for-profit sectors (in the UK and internationally) including:

- Strategy Mapping
- Soft Systems Methodology
- Strategic Choice
- Systems Dynamics

Before joining Sheffield Business School, Michael was a project consultant in housing-led regeneration, working with Local Authorities and Housing Associations to develop and deliver major regeneration projects. Before this he was a senior commercial manager in the clothing industry working for the Dewhirst Group and Marks & Spencer.

About the Research
Three organisations have already taken part in this research, and a further two projects are envisaged. Each study or project is agreed in advance by the participating organisation and the researcher. One of the main outcomes of a systems study is some form of diagram or model which represents the situation of concern as agreed by the participants, together with a number of agreed and

recommended actions on how to improve the situation. A participating organisation can expect one or more of the following outputs:

- A workshop event or meeting facilitated by the researcher
- A diagram(s) or model(s) of the problem situation which may be captured in appropriate software
- A final (and any interim) report as agreed in the schedule between the client organisation and the researcher.
- Training on the use of systems methods
- Meetings with individual stakeholders (or representatives) in order to understand the problem according to the scope of the project.

Potential benefits of being involved in the research

All interventions are different, but the expected benefits of taking part in the research may include:

- A better understanding of the problem situation and its inter-dependencies
- A better understanding of other stakeholders' perspectives of the problem situation.
- A shared language about the problem context
- A shared understanding of the key issues and the likely actions that are required to address the issues
- Identification of areas for policy intervention and leverage leading to action to alleviate the problem
- A shared commitment to improve the situation having been part of the project.
- A new way of working and an insight into alternative methods of managing complex situations.

Appendix H Semi-Structured Question List

Research Project: Systems Thinking for the Uninitiated

An Indicative List of Potential Questions for XXXX

This is an indicative list of questions which may be asked during the proposed interview. Its purpose is to give you a guide to the kinds of questions that might arise in the interview and that are part of my research interests. Please do not feel that you have to rehearse the answers and prepare for the interview. Your experience as a senior manager is highly valued and my aim is to create a conversation about your experience of problem solving and complexity. Depending on your answers different questions might arise, following the natural course of the conversation.

If you have any questions now, please contact me at m.charlton@shu.ac.uk

General Questions

1. Do you have a view on the types of problems you manage and address at your organisation? Do you see them as complex problems? Do you identify with managing complex problems?

2. What does the idea of linking your priorities for action with others' priorities for action mean to you?

3. How frequently do you take part in meetings that tackle the kinds of problems you were trying to address at the meeting/workshop [about XXXX]? How do you find these meetings? Are they effective? Tell me more about this. What makes some meetings more effective than others? How do you find meetings where some form of structured approach is taken, other than the usual meeting agenda?

4. What did you learn, if anything, about systemic PSM/ systems thinking as part of my involvement with your organisation?

5. What knowledge did you have [before my involvement with you] of systemic PSM?

6. When you face a difficult, complex problem at work, how do you go about tackling it? Do you think you need a framework or preferred tool to address the problem? Do you immediately think of people you need to consult? Tell me more about this…

7. Did any kind of insight and/or opportunities arise as a result of applying the approach we used to the problems of [xxxx]?

8. What kinds of difficulties did you experience in applying or adapting the [approach/technique] to the situation of concern [xxxx]?

9. Will you try some of the methods again in your own practise? Have you done so?

10. What might prevent you from having a go with the methods that were used [at the workshop etc.]?

Specific Questions

11. To what extent are the methods used at the [xxxx] workshop similar to methods you use routinely in your organisation?

12. During my involvement with your organisation you saw a [model of xxxx]. What did you make of this model? Was it useful?

13. The electronic version of the model was created by me following the workshop [Here is a copy to remind you]. What happened to the model? Were any actions taken? What happened to the problem situation at [xxxx]?

Appendix I Participant Information Sheet

PARTICIPANT INFORMATION SHEET

WORKING TITLE: Systems Thinking for the Uninitiated

STUDY: The enduring nature of Systems Thinking and the perceived obstacles to using recognisable systems approaches in management.

Introduction
Thank you for agreeing to take part in this study which *may* contribute to my PhD research which explores some of the perceived obstacles to using systems thinking and practice in everyday management. You have been asked to take part in a *conversation* about complex problem solving because of your role in implementing/managing/developing/overseeing/participating in problem solving. As an experienced manager your views on how problem-solving works, or how it should work are welcome, as is any knowledge you may have of systems thinking.

Requirements
The purpose of our conversation is to understand something of your observations, experience, feelings and reflections on complexity, problem solving and problem structuring in your organisation or elsewhere. In taking part in this study you will be helping me to develop my own thinking on the research themes and as a means of developing theory. In taking part you will be helping me to avoid my own biases on the subject.

Data
I will record our conversation using a digital audio device. The resulting MP3 file will be stored on a flash memory card and backed up to secure cloud storage using university facilities. I or a third person will transcribe the audio file into a written manuscript. The manuscript may be sent to you for inspection and you will be given an opportunity to change, add or delete material at that point. The manuscripts will be reviewed and interpreted by me and any examiner of the PhD. If a quotation from the manuscript is used in a subsequent publication or presentation it will be attributed to "a manager at [Anonymous Name] organisation said….". Information, ideas and comments may be used in a viva and in subsequent publications, but they will always be anonymised.

Other
Your part in the study will last for the duration of our conversation only together with any follow up such as checking the manuscript. Any further involvement by you will be completely voluntary and at your discretion. I do not anticipate asking for more of your time as part of the study but if this is the case your consent will be sought. You may withdraw from the study at any time including today's conversation.

Appendix J Participant Consent Form

PARTICIPANT CONSENT FORM

TITLE OF RESEARCH STUDY: Systems Thinking for the Uninitiated

Please answer the following questions by ticking the response that applies

	YES	NO
1. I have read the Information Sheet for this study and have had details of the study explained to me.		
2. My questions about the study have been answered to my satisfaction and I understand that I may ask further questions at any point.		
3. I understand that I am free to withdraw from the study within the time limits outlined in the Information Sheet, without giving a reason for my withdrawal or to decline to answer any particular questions in the study without any consequences to my future treatment by the researcher.		
4. I agree to provide information to the researchers under the conditions of confidentiality set out in the Information Sheet.		
5. I wish to participate in the study under the conditions set out in the Information Sheet.		
6. I consent to the information collected for the purposes of this research study, once anonymised (so that I cannot be identified), to be used for any other research purposes.		

Participant's Signature: _____
Date: _____

Participant's Name (Printed): _____

Contact details:

_____
_

_____
__

Researcher's Name (Printed): _____

Researcher's Signature: _____

Researcher's contact details:
(Michael Charlton, Sheffield Business School, Sheffield Hallam University, Howard Street S1 1WB Sheffield UK Email: m.charlton@shu.ac.uk)

Please keep your copy of the consent form and the information sheet together.

Appendix K GMC Board Meeting Details

This appendix continues the narrative from section 4.3.3

GMC board meetings are planned well in advance at the start of year. For meetings to be quorate, unpaid volunteer board members need plenty of notice. The meeting took place in late June 2017, in Islington, London. Several board members live and work in London, and for everyone outside of London it is the most convenient place to meet. The chair of the board works for a London Council and has access to meeting facilities. He has booked out a meeting place for the day in an unmarked building on Old Street. The entrance is just off the street, there is a security code to enter the building, and a couple of ante-rooms to walk through before getting to the main meeting room on the ground floor, which has a broad, white table with chairs for about 12-15 people. The air conditioning is noisy, and you can hear the rumble of traffic on Old Street outside.

The meeting participants begin to assemble, all arriving at different times. The mood is friendly and relaxed; there is talk about journey times, getting caught in showers, and this morning's travel hardships. The CEO relates his morning's experience with several docking points (for cycle storage). "Some are not working", he says, and there is a mixture of mirth and commiseration from those assembling. My own journey to the venue is uneventful, save for a surprise telephone call from the client as I am boarding the train. "Have you brought the rich picture?", she asks. "No", is the answer from me. It had been created two weeks ago and there was no indication that she wanted it. I felt instant regret that the picture had not been enlarged and pre-prepared just-in-case.

After grabbing coffee or tea, seven trustees are present, two senior employees and an observer. The client has already secured consent for my attendance from the trustees by email. There were no objections. But after briefly explaining my research I insist that the board deliberates on the matter again while I excuse myself from the room. After a couple of minutes, I am called back into the meeting by the client. There is still no objection but if the board decides that a sufficiently sensitive issue arises then I will be asked to leave until the matter has been discussed and decided.

The purpose of the meeting was to take stock of GMC's position. The morning session would review the sector generally and the trends affecting car-sharing, followed by an update on the fast-growing bike sharing side of the operation. The afternoon would be devoted to strategy and to the future of GMC.

The Chair introduced the meeting and was very supportive. He wanted members to discuss emerging issues, ask important questions, and tackle big issues, but this would be done in the spirit of "how the Board could help". It was important that the Board could "delve down into the issues", be clear and be decisive.

The Morning Session

The morning session allowed everyone to be heard. Board members have a variety of experience in the private and public sectors. All could talk about the sector generally, but some members were asked to contribute to particular themes based on their background and experience. Themes included:

- The public sector and Local Authorities
- Operators (of car clubs, bike share schemes etc.)
- The sector generally
- Specific Geographies (London, Scotland and the Rest)
- Policy

The CEO provided a review of car-sharing trends. Car clubs and car sharing had become "mainstreamed" and commercialised. Central government appeared to be unconcerned about market failure, where this occurs regionally, and felt the private sector was much better suited to dealing with the risk. Across the public sector there was very little money but still a "gaping hole in awareness". Where there was awareness there was little appetite to get involved in awarding grants and so the opportunity to advocate new car sharing schemes was very limited. Against this background there was evidence that the general public, and especially young people, are more open than ever to the idea of car sharing.

BB provided an overview of the bike-share sector. Bike share schemes were now operational in 18 cities; 5-6 cities were in development. The biggest

change was new operators - predominantly Chinese enterprises with considerable financial backing - intent on establishing dock-less schemes in numerous UK cities. All eyes were on Manchester, the first to launch a dock-less model in the UK, operated by Mobike. Dock-less schemes can run without public subsidy, but it is common for operators to seek accreditation from GMC in order to build good relationships with Local Authorities who can take enforcement action against irresponsible bike use. In contrast to the car-share sector, bike share was "exciting", it was more innovative in respect of delivery models and it offered better chances of addressing social exclusion.

BB also reported the results of the “3 things” agenda item, where the trustees were asked to think about – in advance of the meeting - what they considered to be the most realistic opportunities for GMC to pursue in order to be viable in the short-to-medium term. BB first discussed her thematic analysis of the contributions, but then surprised me, by asking me to explain the strategic map which had been created for the client (see Figure 4-7), copies of which were distributed to the trustees. This would be my only contribution to the meeting. Much later during the review interview with the client which evaluated the whole intervention I asked her: “Why did you feel the need to introduce the strategy map and why did you ask me to explain it?” She replied:

> So, my asking the [board trustees] questions in advance [of the meeting] was in order to try to save some time and in order to trigger them into thinking about the kind of issues that we'd be wanting them to think about on the day, and spending a bit of time sort of preparing and pulling that together. I think when I looked at them, the feedback that came back was really quite disparate and lacking in…. kind of any easy answers as to what we were trying to say with the opportunities and ways to go forward. So, I thought it was useful that you had tried to formulate that into looking at where there are links and looking at where there were potential pointers to our strategy. So then, answering your specific question. I think because I hadn't actually pulled that together, I didn't feel like I could explain it very well. And so it

was useful to have you there to sort of say, from an outsider's point of view, this is what I saw were the links and what was there really."

I asked: "Do you think the trustees understood the strategy map?"

BB: "I think they were being overwhelmed with information. I think there wasn't enough time. I think fundamentally with all of these things, there wasn't enough time."

At a more local level, the general picture from Local Authorities was that everything was "quiet". There was little demand (production) for new car club parking bays because money was tight, and pressures to maintain parking revenue meant that Councils were reluctant to give spaces away to car clubs. There was some pressure to electrify existing parking bays. Councils were concerned about how bikes would be used in dock-less schemes; they were worried about abandoned bikes causing obstruction. It was suggested that there may be a role for GMC here, but the world of enforcement seemed to contradict the notion of advocacy. There was felt to be increasing demands on Councils to do more and more especially with regard to "big data" and MaaS.

Several comments were made about the maturity of the car-sharing market. Community-grown, grass-root car clubs were thought to be "at the top of the S curve". New players could now meet the needs of individuals who did not wish to own a car but wanted to use one occasionally. The same need could be met through Uber, but in this case, you get a driver too. Car manufacturers (e.g. Ford, Jaguar) were meeting some of this demand through experiments in smart mobility programmes which afforded the manufacturers opportunity to demonstrate their approach to corporate responsibility and boosted their credentials as service providers.

There were opportunities for GMC in Scotland. A forthcoming transport bill would set the priorities. Local Authority officers were thought to be "stretched" and would need to be supported, but there was very little revenue funding available. Opportunities to "use and crunch" data in order to provide insights

were substantial, and there were thought to be some smaller openings in providing sustainable schemes in tourism projects to boost economic activity.

London and its boroughs were thought of as an object lesson in poor integration: plenty of schemes and choices, but with inter-operability problems. Users of shared mobility were increasingly frustrated with the lack of consistency and integration across different Boroughs. It was felt that an Oyster Card for all services was required, hence the growing interest in aggregators and MaaS.

The most relevant policy background affecting the sector was that of air quality. A national diesel scrappage scheme had been mooted. There was also the possibility of Chinese manufacturers flooding the UK market with cheap electric vehicles. These events would likely cause more disruption and potentially more opportunity for GMC.

The morning session had been about information sharing. Some attendees appeared to have more knowledge and experience than others, and therefore made more contribution. But no one theme or one person had dominated the proceedings. Attendees listened to each other politely and respectfully.

Lunch

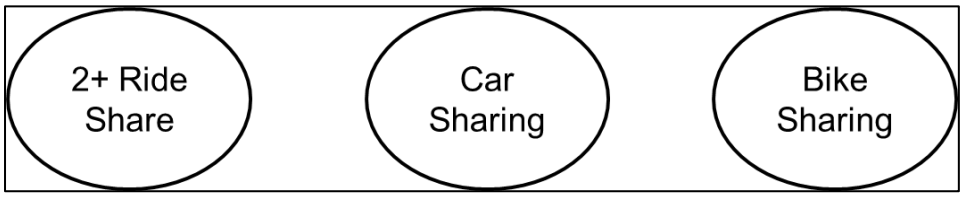
At lunch everyone adjourned to a local café called "*Look Mum, no hands!"* where a table had been booked. The café is part eating establishment and part bicycle workshop. Bikes are serviced and repaired on site, cycling merchandise is on sale, and the café serves hot and cold food, hot beverages, soft drinks, and alcohol. It was another reminder of GMC's values and interests. Some of the board members were new; this was a chance to get to know each other. Again, the atmosphere was good humoured, relaxed, and informal. I was asked about my research. Much of the conversation continued to be about information sharing and some "gossip" about the sector, who knows who, who's moved job etc.?

The Afternoon Session

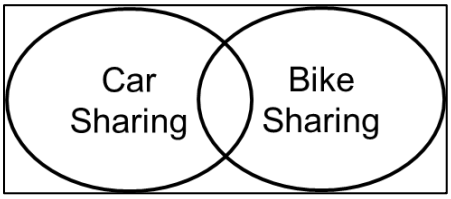
Before the Board meeting the Executive Director had sought the opinions of several trusted players in the sector; organisations that might be classed as collaborators in some senses and competitors in others. Among the consultees were car-share operators, the BVRLA, the RAC Foundation (Royal Automobile Club), the Institute for Public Policy Research (IPPR) and others. They were consulted on a range of questions which focused on the scope of and need for advocacy (particularly of car clubs and car sharing) in the new and changing environment of the transport sector. The responses were pre-circulated to Board members in a 20-page document written by the CEO which helped to begin the afternoon discussions, and which the Chair described as "this is where things can get a bit loose". I had not seen the 20-page summary document but had seen some of the emails that were the source material for the document. The deputy CEO had also influenced this document, though it was not clear whether any of the systems thinking had influenced the content in any way. Later, BB said of some of the conceptual models:

> “Yeah, I mean, it really helped me formulate what my thoughts and strategies were going into the discussions. Not so much the main board meeting, but the sub meetings with the Executive Director (CEO) leading up to that, and subsequent to that [meeting].”

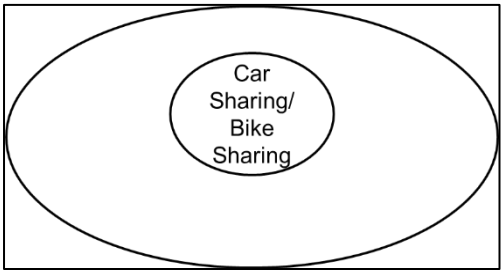
The earliest discussions were about GMC's identity. "What we are?" was something that had been discussed at the last Board meeting and continued here. Various descriptions of "models" were tabled, for example the "fragmentation model", "mobility transition" and the "coherence model". These became more meaningful as the incoming Chair of GMC took advantage of flip chart paper to sketch a range of simple Venn diagrams and concentric circles to illustrate possible structures and relationships (see Appendix Figure 10 to Appendix Figure 14).



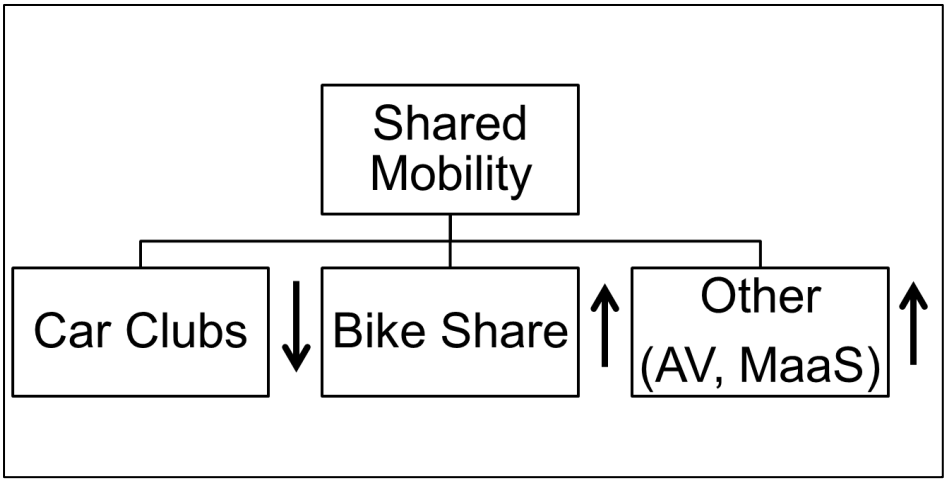
Appendix Figure 10: GMC's Operations Working Independently



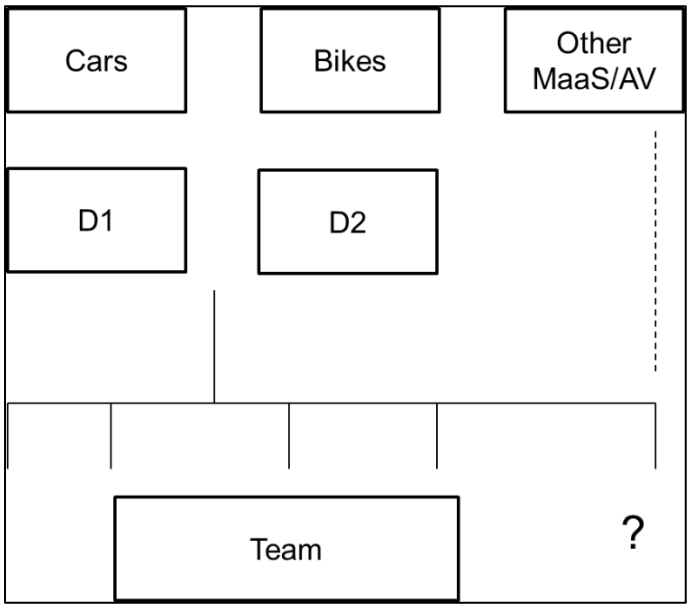
Appendix Figure 11: Overlap of car sharing and bike sharing thought to be an accurate picture of current ways of working.



Appendix Figure 12: GMC operations as parts of growing shared mobility



Appendix Figure 13: Hierarchical arrangement of means to achieve shared mobility, arrows change (up/down) depending on the geography where some modes more prevalent



Appendix Figure 14: Anticipating resources for GMC, D refers to director.

It was generally agreed that there was no "clear line of direction out of the 20-page document". Appendix Figure 10 represented GMC's current operations, seen independently. Appendix Figure 11 saw the two main operations working independently but overlapping in certain situations and this was felt to be how GMC operated currently. Appendix Figure 13 placed the organisation in the context of the broader idea of shared mobility and traced its relationship to the disruptive elements of MaaS and AVs (labelled as "other"). The Board recognised that there may indeed be a need for an organisation to coordinate and provide advocacy in the transition to a radically different view of mobility/transport, but GMC was not this kind of organisation and did not have the resources. It could, however, *support* a new "transition" body.

The mention of resources sparked further discussions on identity. Did the charity want to be a small player operating from a single office with "one filing cabinet", with (limited) aims and resources to match? Or did the charity want to work from its core principles and values creating an organisation that everyone could be proud of? If the latter was not possible, was there much point in the former? This inevitably led to discussions about funding determining the charity's purpose and a discussion about new forms of income. There was also discussion about the future of the car-sharing work. If this had been "mainstreamed" was it not the case that the charity's objectives had been more-

or-less achieved and therefore there was no longer a need? Car sharing had been achieved in more profitable locations, but in rural and poorer regions levels of provision were inadequate or non-existent. So, there was still a need for advocacy of car clubs but insufficient funding to do this at present. The discussions about income also led to speculation about income generation for other related organisations in the sector, for example the Community Transport Association (CTA).

From time to time, there was discussion about core competencies and about the skillsets of charity officers. This was also linked to some uncertainty the Board faced about the CEO's tenure. It was agreed that GMC does "accreditation well, it handles data well and information sharing". There was some belief that GMC was a specialist in the sector and that no one offers the same type of support. All this expertise could help to *support* a new mobility transition body, should one emerge. The new body would have much stronger lobbying skills, something that the charity lacked. It was agreed that both parts of the organisation should continue but strategic alliances should be pursued, especially in the car sharing sector. This was a clear mandate to "stay together". Finally, there was also discussion about re-branding the organisation, talk about the upcoming conference, and about how GMC could run future conferences that address the changing environment.

The Chair provided both interim and final summaries of the meeting. There was no formal voting on decisions taken; this appeared to be unanimous, though it was difficult to gauge.

References

Achterbergh, J., & Vriens, D. (2002). Managing viable knowledge. *Systems Research and Behavioral Science, 19*(3), 223-241. doi:10.1002/sres.440

Achterbergh, J., & Vriens, D. (2010a). Introducing organizations as social systems conducting experiments. *Organizations* (pp. 1-29). Berlin, Heidelberg: Springer Berlin Heidelberg. doi:10.1007/978-3-642-14316-8_1 Retrieved from http://link.springer.com/10.1007/978-3-642-14316-8_1

Achterbergh, J., & Vriens, D. (2010b). *Organizations* (2. Aufl. ed.). Berlin, Heidelberg: Springer-Verlag. Retrieved from http://ebooks.ciando.com/book/index.cfm/bok_id/232568

Achterbergh, J., & Vriens, D. (2010c). The social “arche,” organizations as social systems: Luhmann. *Organizations* (pp. 117-166). Berlin, Heidelberg: Springer Berlin Heidelberg. doi:10.1007/978-3-642-14316-8_4 Retrieved from http://link.springer.com/10.1007/978-3-642-14316-8_4

Ackermann, F. (2011). Getting “messy” with problems: The challenges of teaching “soft” OR. *INFORMS Transactions on Education, 12*(1), 55-64.

Ackermann, F. (2012a). Problem structuring methods ‘in the dock’: Arguing the case for soft OR. *European Journal of Operational Research, 219*(3), 652-658.

Ackermann, F. (2012b). Problem structuring methods ‘in the dock’: Arguing the case for soft OR. *European Journal of Operational Research, 219*(3), 652-658. doi:10.1016/j.ejor.2011.11.014

Ackermann, F., Alexander, J., Stephens, A., & Pincombe, B. (2020a). In defence of soft OR: Reflections on teaching soft OR. *Journal of the Operational Research Society, 71*(1), 1-15.

Ackermann, F., Alexander, J., Stephens, A., & Pincombe, B. (2020b). In defence of soft OR: Reflections on teaching soft OR. *Journal of the Operational Research Society, 71*(1), 1-15. doi:10.1080/01605682.2018.1542960

Ackermann, F., & Eden, C. (2011). *Making strategy: Mapping out strategic success* (2nd ed ed.). London: SAGE.

Ackoff, R. (2008). *Systems thinking for curious managers* Triarchy Press.

Ackoff, R. L. (1979). The future of operational research is past. *Journal of the Operational Research Society, 30*(2), 93-104. doi:10.1057/jors.1979.22

Ackoff, R. L. (1981). The art and science of mess management. *Interfaces, 11*(1), 20-26. doi:10.1287/inte.11.1.20

Ackoff, R. L. (2006). Why few organizations adopt systems thinking. *Systems Research and Behavioral Science, 23*(5), 705. doi:https://doi-org.hallam.idm.oclc.org/10.1002/sres.791

Åkerstrøm Andersen, N., & Grønbæk Pors, J. (2016). *Public management in transition: The orchestration of potentiality*. Bristol, UK: Policy Press.

Franco, L. (2009). Problem structuring methods as intervention tools: Reflections from their use with multi-organisational teams☆. *Omega, 37*(1), 193-203. doi:10.1016/j.omega.2006.08.001

Alvesson, M. (2010). *Interpreting interviews*. Los Angeles, USA: Sage.

Alvesson, M., & Kärreman, D. (2007). Constructing mystery: Empirical matters in theory development. *Academy of Management Review, 32*(4), 1265-1281.

Alvesson, M., & Sandberg, J. (2013). *Constructing research questions: Doing interesting research*. Los Angeles, USA: Sage.

Andersen, N. Å. (2003). *Discursive analytical strategies: Understanding foucault, koselleck, laclau, luhmann*. London, UK: Policy Press.

Angela, E., & Jon, W. (2017). *Complexity approach to sustainability, A: Theory and application* World Scientific.

Armson, R. (2011). *Growing wings on the way systems thinking for messy situations*. Devon, UK: Triarchy Press.

Arnold, R. D., & Wade, J. P. (2017). A complete set of systems thinking skills. *Insight, 20*(3), 9-17.

Ashby, W. R. (1957). *An introduction to cybernetics*. London, UK: Chapman & Hall Ltd.

Barel, Y. (1979). *Le paradoxe et le système: Essai sur le fantastique social* Presses universitaires de Grenoble.

Bateson, G. (1972a). Form, substance and difference. In Gregory Bateson (Ed.), *Steps to an ecology of mind* (pp. 454-471). Chicago, USA: University of Chicago Press.

Bateson, G. (1972b). The logical categories of learning and communication. *Steps to an Ecology of Mind,* , 279-308.

BBC Radio. (2021). *The life scientific - the patrick vallance interview*. Presented by Jim Al-Khalili: BBC Radio 4.

Beer, S. (1966). *Decision and control: The meaning of operational research and management cybernetics*. Chichester, England: John Wiley & Sons Ltd.

Beer, S. (1979). *The heart of enterprise*. Chichester, England: John Wiley & Sons.

Beer, S. (1981). *Brain of the firm: The managerial cybernetics of organization* (2nd ed.). Chichester, England.: John Wiley & Sons Ltd.

Beer, S. (1985). *Diagnosing the system for organizations*. Chichester, England: John Wiley & Sons Inc.

Bell, S., Berg, T., & Morse, S. (2019). Towards an understanding of rich picture interpretation. *Systemic Practice and Action Research, 32*(6), 601-614. doi:10.1007/s11213-018-9476-5

Berger, J. (2008). *Ways of seeing*. London, England: Penguin.

Bergvall-Kåreborn, B. (2002). Qualifying function in SSM modeling—a case study. *Systemic Practice and Action Research, 15*(4), 309-330.

Boblin, S. L., Ireland, S., Kirkpatrick, H., & Robertson, K. (2013). Using stakeâ€™s qualitative case study approach to explore implementation of evidence-based practice. *Qualitative Health Research, 23*(9), 1267-1275.

Boote, D. N., & Beile, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher, 34*(6), 3-15. doi:10.3102/0013189X034006003

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful literature review* (2nd ed.). Los Angeles, USA: Sage.

Borch, C. (2011). *Niklas luhmann*. Abingdon, UK: Routledge.

Boulton, J. G., Allen, P. M., & Bowman, C. (2015). *Embracing complexity: Strategic perspectives for an age of turbulence*. Oxford, UK: OUP Oxford.

Bowles, D., & Cooper, C. L. (2009). *Employee morale driving performance in challenging times /*. Basingstoke, UK: Palgrave Macmillan.

Brocklesby, J. (1997). Becoming multimethodology literate: An assessment of the cognitive difficulties of working across paradigms. In Mingers, John & Gill, Anthony (Ed.), *Multimethodology: The theory and practice of combining management science methodologies* (pp. 216). Chichester, England: Wiley,.

Brocklesby, J. (2007). The theoretical underpinnings of soft systems methodology—comparing the work of geoffrey vickers and humberto maturana. *Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research, 24*(2), 157-168. doi:10.1002/sres.819

Brocklesby, J. (2016). The what, the why and the how of behavioural operational research—An invitation to potential sceptics. *European Journal of Operational Research, 249*(3), 796-805. doi:10.1016/j.ejor.2015.09.034

Brocklesby, J., & Mingers, J. (1999). The cognitive limits on organisational reframing: A systems perspective based on the theory of autopoiesis. Paper presented at the *International Systems Dynamics Conference,*

Bryson, J. M., Ackermann, F., & Eden, C. (2014). *Visual strategy: Strategy mapping for public and nonprofit organizations* John Wiley & Sons.

Buckle Henning, P., & Chen, W. (2012). Systems thinking: Common ground or untapped territory? *Systems Research and Behavioral Science, 29*(5), 470-483.

Buckle Henning, P., Wilmhurst, J., & Yearworth, M. (2012). Understanding systems thinking: An agenda for applied research in industry. Paper presented at the *Proceedings of the 56th Annual Meeting of the ISSS-2012, San Jose, CA, USA,*

Buckle-Henning, P. (2008). A boundary critique of gender in the project management body of knowledge. Paper presented at the *Proceedings of the 50th Annual Meeting of the ISSS-2006, Sonoma, CA, USA,*

Burger, K., White, L., & Yearworth, M. (2019). Developing a smart operational research with hybrid practice theories. *European Journal of Operational Research, 277*(3), 1137-1150. doi:10.1016/j.ejor.2019.03.027

Burnell, D. (2016). Systems thinking orientation assessment framework (STOAF): Towards identifying the key characteristics of the systems thinker and understanding their prevalence in the layperson. *Systems Research and Behavioral Science, 33*(3), 471-482.

Burrell, G., & Morgan, G. (1979). *Sociological paradigms and organisational analysis*. London, UK: Heinemann.

Byrne David, & Callaghan Gill. (2013). *Complexity theory and the social sciences: The state of the art*. Abingdon, UK: Routledge.

Cabrera, D. A. (2006). *Systems thinking (doctoral dissertation). cornell university, USA.*

Cabrera, D., & Colosi, L. (2009). Thinking at every desk. *Research Center for Thinking in Education: Ithaca, New York,*

Cabrera, D., & Cabrera, L. (2021). Developing personal mastery of systems thinking. *The Routledge Handbook of Systems Thinking,* , 1-40.

Cabrera, D., Cabrera, L., & Powers, E. (2015). A unifying theory of systems thinking with psychosocial applications. *Systems Research and Behavioral Science, 32*(5), 534-545.

Cabrera, D., Colosi, L., & Lobdell, C. (2008). Systems thinking. *Evaluation and Program Planning, 31*(3), 299-310.

Callon, M. (1984). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of st brieuc bay. *The Sociological Review, 32*(1_suppl), 196-233. doi:10.1111/j.1467-954X.1984.tb00113.x

Capra, F., & Luisi, P. L. (2014). *The systems view of life: A unifying vision* Cambridge University Press.

Cavaleri, S., & Obłój, K. (1993). *Management systems: A global perspective*. London, UK: Wadsworth.

Checkland Peter. (1984). Rethinking a systems approach. In Tomlinson Rolfe, & Kiss Istvan (Eds.), *Rethinking the process of operational research & systems analysis* (pp. 43-60). Oxford, UK: Pergamon. doi:10.1016/B978-0-08-030830-2.50009-X

Checkland Peter, & Tsouvalis Costas. (1996). *Reflecting on SSM : The dividing line between 'real world' and 'systems thinking world'.* Unpublished manuscript.

Checkland, P. (1981). *Systems thinking, systems practice*. Chichester, England: John Wiley & Sons Ltd.

Checkland, P. (1999). *Soft systems methodology : A 30-year retrospective ; and, systems thinking, systems practice* (New ed.). Chichester, England: John Wiley.

Checkland, P. (2011). *Autobiographical retrospectives: Learning your way to 'action to improve' – the development of soft systems thinking and soft systems methodology*. Great Britain : Gordon and Breach Science Publishers. doi:10.1080/03081079.2011.571437

Checkland, P., & Holwell, S. (1997). *Information, systems and information systems: Making sense of the field*. Chichester, England: John Wiley & Sons Ltd.

Checkland, P., & Holwell, S. (1998). Action research: Its nature and validity. *Systemic Practice and Action Research, 11*(1), 9-21.

Checkland, P., & Poulter, J. (2006). *Learning for action : A short definitive account of soft systems methodology, and its use for practitioner, teachers and students*. Chichester, England: John Wiley.

Checkland, P., & Scholes, J. (1990). *Soft systems methodology in action*. Chichester, England: John Wiley & Sons Ltd.

Checkland, P., & Winter, M. (2006). Process and content: Two ways of using SSM. *Journal of the Operational Research Society, 57*(12), 1435-1441.

Churchman, C. W.The systems approach and its enemies. 1979.

Churchman, C. W. (1968). *Challenge to reason*. New York, USA: McGraw-Hill.

Churchman, C. W. (1971). *Design of inquiry systems. basic concepts of systems and organization* Basic Books.

Clark, T. (1995). *Managing consultants*. Milton Keynes: McGraw-Hill Education. Retrieved from https://ebookcentral.proquest.com/lib/[SITE_ID]/detail.action?docID=4960732

Clark, T., & Salaman, G. (1998). Telling tales: Management gurus' narratives and the construction of managerial identity. *Journal of Management Studies, 35*(2), 137-161.

Coghlan, D., & Shani, A. B. R. (2005). Roles, politics, and ethics in action research design. Systemic Practice and Action Research, 18(6), 533-546. doi:10.1007/s11213-005-9465-3

Connell, N. (2001). Evaluating soft OR: Some reflections on an apparently 'unsuccessful'implementation using a soft systems methodology (SSM) based approach. *Journal of the Operational Research Society, 52*(2), 150-160. doi:10.1057/palgrave.jors.2601054

Cooren, F., & Seidl, D. (2020). Niklas luhmann's radical communication approach and its implications for research on organizational communication. *The Academy of Management Review, 45*(2), 479-497. doi:10.5465/amr.2018.0176

Corley, K. G., & Gioia, D. A. (2011). Building theory about theory building: What constitutes a theoretical contribution? *The Academy of Management Review, 36*(1), 12-32. doi:10.5465/amr.2009.0486

Covey, S. R. (2013). *The 7 habits of highly effective people : Powerful lessons in personal change* (25th ed.). London: Simon & Schuster.

Cwarel Isaf Institute. (2002). The viable systems model. Retrieved from https://www.kybernetik.ch/en/fs_methmod3.html

Czarniawska, B. (2011). Introduction to the special themed section: Fashion in research and in management. *Organization Studies, 32*(5), 599-602. doi:10.1177/0170840611405422

Czarniawska, B., & Sevón, G. (2005). Translation is a vehicle, imitation its motor, and fashion sits at the wheel. In B. Czarniawska, & G. Sevón (Eds.), *Global ideas: How ideas, objects and practices travel in the global economy* (). Malmo, Sweden: Liber and Copenhagen Business School Press.

Czarniawska-Joerges, B., & Sevón, G. (2005). *Global ideas: How ideas, objects and practices travel in a global economy*. Malmo, Sweden: Copenhagen Business School Press.

Davies, L., & Ledington, P. (1991). *Information in action: Soft systems methodology* Macmillan International Higher Education.

Davis, M. S. (1971). That's interesting: Towards a phenomenology of sociology and a sociology of phenomenology. *Philosophy of the Social Sciences, 1*(4), 309. Retrieved from https://search.proquest.com/docview/1300114738

Donaires, O. S. (2006). *A critical heuristic approach to the establishment of a software development process*. New York, N.Y.] : Kluwer Academic/Plenum Publishers. doi:10.1007/s11213-006-9033-5

Dun & Bradstreet. (2019). Retrieved SOURCE REDACTED

Easterby-Smith, M., Thorpe, R., Jackson, Paul (Paul R.), & Jaspersen, L. J. (2018). *Management & business research*. London: SAGE.

Easterby-Smith, M., Thorpe, R., & Jackson, P. R. (2015). *Management and business research* Sage.

Eden, C., Ackermann, F., Bryson, J. M., Richardson, G. P., Andersen, D. F., & Finn, C. B. (2009). Integrating modes of policy analysis and strategic management practice: Requisite elements and dilemmas. *The Journal of the Operational Research Society., 60*(1), 2-13. doi:10.1057/palgrave.jors.2602575

Eden, C., & Ackermann, F. (2006). Where next for problem structuring methods. *Journal of the Operational Research Society,* , 766-768. doi:10.1057/palgrave.jors.2602090

Eden, C. (1989). Using cognitive mapping for strategic options development and analysis (SODA). *Rational Analysis for a Problematic World,* , 21-42.

Eden, C. (1995). On evaluating the performance of 'wide-band'GDSS's. *European Journal of Operational Research, 81*(2), 302-311. doi:10.1016/0377-2217(93)E0241-O

Eden, C., & Ackermann Fran. (1998). *Making strategy : The journey of strategic management*. London, UK: Sage.

Eden, C., & Ackermann, F. (2018). Theory into practice, practice to theory: Action research in method development. *European Journal of Operational Research, 271*(3), 1145-1155. doi10.1016/j.ejor.2018.05.061

Eden, C., & Huxham, C. (2006). Researching organizations using action research. In Clegg Stewart (Ed.), *The sage handbook of organization studies* (2nd ed., pp. 388-408). London, UK: Sage.

Edwards, M. G. (2014). Misunderstanding metatheorizing. *Systems Research and Behavioral Science, 31*(6), 720-744. doi:10.1002/sres.2203

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532-550. doi:0.5465/amr.1989.4308385

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal, 50*(1), 25-32. doi:10.5465/amj.2007.24160888

Espejo, R. (2017). Cybernetic argument for democratic governance: Cybersyn and cyberfolk. *Cybernetics: State of the Art,* , 34-57.

Espejo, R., Bowling, D., & Hoverstadt, P. (1999). The viable system model and the viplan software. *Kybernetes, 28*(6/7), 661-678.

Espejo, R., & Reyes, A. (2011). *Organizational systems: Managing complexity with the viable system model* Springer Science & Business Media.

Fincham, R., & Clark, T. (2009). *Introduction: Can we bridge the rigour-relevance gap?*. Oxford] : Blackwell Publishers. doi:10.1111/j.1467-6486.2009.00834.x

Fisher, R., Ury, W., & Patton, B. (1991). *Getting to yes* (2. ed. ed.). New York, USA: Penguin Books.

Flick, U. (2013). *The SAGE handbook of qualitative data analysis* Sage.

Flood, R. L., & Jackson, M. C. (1991a). Critical systems heuristics: Application of an emancipatory approach for police strategy toward the carrying of offensive weapons. *Systems Practice, 4*(4), 283-302.

Flood, R. L., & Jackson, M. C. (1991b). Total systems intervention: A practical face to critical systems thinking. *Systems Practice, 4*(3), 197-213. doi:10.1007/BF01059565

Foote, J. L., Gregor, J. E., Hepi, M. C., Baker, V. E., Houston, D. J., & Midgley, G. (2007). Systemic problem structuring applied to community involvement in water conservation. *Journal of the Operational Research Society, 58*(5), 645-654.

Franco, A., Shaw, D., & Westcombe, M. (2007). Taking problem structuring methods forward. *Journal of the Operational Research Society, 58*(5), 545-546.

Franco, L. A., Cushman, M., & Rosenhead, J. (2006). Facilitating collaboration across organisational boundaries: An exploratory study using problem structuring methods.

Franco, L. A., & Greiffenhagen, C. (2018). Making OR practice visible: Using ethnomethodology to analyse facilitated modelling workshops. *European Journal of Operational Research, 265*(2), 673-684.

Franco, L. A., & Hämäläinen, R. P. (2016). Behavioural operational research: Returning to the roots of the OR profession. *European Journal of Operational Research, 249*(3), 791-795. doi:10.1016/j.ejor.2015.10.034

Franco, L. A., & Rouwette, E. A. (2011). Decision development in facilitated modelling workshops. *European Journal of Operational Research, 212*(1), 164-178.

Freeman, R. E. (2010). *Strategic management : A stakeholder approach*. Cambridge: Cambridge University Press.

Freeman, R., & Yearworth, M. (2017). *Climate change and cities: Problem structuring methods and critical perspectives on low-carbon districts*. Amsterdam : Elsevier BV. doi:10.1016/j.erss.2016.11.009

Friend, J., & Hickling, A.1997, planning under pressure. the strategic choice approach,(butterworth-heinemann, oxford).

Friend, J. K., & Hickling, A. (2005). *Planning under pressure: The strategic choice approach* Routledge.

Friend, J., & Jessop, N. (1977). *Local government and strategic choice (routledge revivals): An operational research approach to the processes of public planning* Routledge.

Gareth, M. (1997). *Images of organization* (3rd ed.). Los Angeles, USA: SAGE Publications.

Georgiou, I. (2012). Messing about in transformations: Structured systemic planning for systemic solutions to systemic problems. European Journal of Operational Research, 223(2), 392-406. doi:10.1016/j.ejor.2012.06.010

Gibbons, M. (1994). *The new production of knowledge: The dynamics of science and research in contemporary societies*. London, England: Sage.

Graebner, M. E. (2004). Momentum and serendipity: How acquired leaders create value in the integration of technology firms. *Strategic Management Journal, 25*(8â€□9), 751-777.

Granovetter, M. (1983). The strength of weak ties: A network theory revisited. *Sociological Theory,* , 201-233.

Gregory, A. J., & Atkins, J. P. (2012). It looks like a PSM and it does what a PSM does but is it a PSM? Paper presented at the *Paper Presented at the 25th Conference on Operational Research (Euro 2012),* Vilnius, Lithuania.

Gregory, A. J., Atkins, J. P., Burdon, D., & Elliott, M. (2013). A problem structuring method for ecosystem-based management: The DPSIR modelling process. *European Journal of Operational Research, 227*(3), 558-569.

Gregory, A. J., Atkins, J. P., Midgley, G., & Hodgson, A. M. (2020). Stakeholder identification and engagement in problem structuring interventions. *European Journal of Operational Research, 283*(1), 321-340.

Gregory, W. J. (1996). Discordant pluralism: A new strategy for critical systems thinking. *Systems Practice, 9*(6), 605-625. doi:10.1007/BF02169216

Habermas, J. (1987). *Knowledge and human interests*. London, England: Polity Press.

Hallett, D. (2020). Authority vs influence: Applying the BE-DO-HAVE model. Retrieved from https://hallettleadership.com/2020/01/20/authority-vs-influence-applying-the-be-do-have-model/

Handy, C. B. (1993). *Understanding organizations* (4th ed.). London, UK: Penguin.

Harrison, J. R., & March, J. G. (1984). Decision making and postdecision surprises. *Administrative Science Quarterly, 29*(1), 26-42. doi:10.2307/2393078

Hart, C. (2018). *Doing a literature review: Releasing the research imagination*. London, UK: Sage.

Harwood, S. A. (2012). The management of change and the viplan methodology in practice. *Journal of the Operational Research Society, 63*(6), 748-761.

Harwood, S. A. (2019). A question of interpretation: The viable system model (VSM). *European Journal of Operational Research, 274*(3), 1198-1201. doi:10.1016/j.ejor.2018.10.054

Heritage, J. (2011). Conversation analysis: Methodological aspects. *Aspects of oral communication* (pp. 391-418) de Gruyter.

Heusinkveld, S. (2013). *The management idea factory: Innovation and commodification in management consulting*. New York, USA: Routledge.

Hindle, G. A. (2011). Teaching soft systems methodology and a blueprint for a module. doi:10.1287/ited.1110.0068ca

Hobbs, C. a. (2019). *Systemic leadership for local governance tapping the resource within /*. Basingstoke, Hampshire : Palgrave Macmillan.

Holwell, S. (2000). Soft systems methodology: Other voices. *Systemic Practice and Action Research, 13*(6), 773-797. doi:10.1023/A:1026479529130

Horlick-Jones, T., & Rosenhead, J. (2007). The uses of observation: Combining problem structuring methods and ethnography. *Journal of the Operational Research Society, 58*(5), 588-601.

Hoverstadt, P. (2010). The viable system model. *Systems approaches to managing change: A practical guide* (pp. 87-133) Springer.

Hoverstadt, P., & Loh, L. (2017). *Patterns of strategy* Routledge.

Howard, N., Bennett, P., & Bryant, J. (2001). Drama theory and confrontation analysis. *Rational Analysis for a Problematic World Revisited: Problem Structuring Methods for Complexity, Uncertainty and Conflict.Wiley, Chichester,*

HUANG, H. B. (2010). What is good action research? *Action Research (London, England), 8*(1), 93-109. doi:10.1177/1476750310362435

IATE (Institute for Apprenticeships and Technical Education). (2022). Systems thinking practitioner. Retrieved from https://www.instituteforapprenticeships.org/apprenticeship-standards/systems-thinking-practitioner-v1-0

Ison, R. (2010). *Systems practice: How to act in a climate change world* Springer Science & Business Media.

Ison, R., & Straw, E. (2020). *The hidden power of systems thinking: Governance in a climate emergency*. Abingdon, UK: Routledge.

Jackson, M. C. (1997). Pluralism in systems thinking and practice. . In Mingers John, & Gill Anthony (Eds.), *Multimethodology: The theory and practice of combining management science methodologies* (pp. 347-378). Chichester, England: Wiley.

Jackson, M. C. (2019). *Critical systems thinking and the management of complexity* Hoboken, NJ: Wiley.

Jackson, M. (1992). *Systems methodology for the management sciences*. London, UK: Plenum Press.

Jackson, M. C. (1990). Beyond a system of systems methodologies. *Journal of the Operational Research Society, 41*(8), 657-668. doi:10.1057/jors.1990.96

Jackson, M. C. (2000). *Systems approaches to management*. New York, USA: Kluwer Academic.

Jackson, M. C. (2003). *Systems thinking : Creative holism for managers*. Chichester, West Sussex: John Wiley & Sons.

Jackson, M. C., & Flood, R. L. (1991). *Creative problem solving: Total systems intervention*. Chichester, England: John Wiley & Sons Ltd. doi:10.1007/978-1-4899-2632-6_11

Jackson, M. C., & Keys, P. (1984). Towards a system of systems methodologies. *Journal of the Operational Research Society, 35*(6), 473-486. doi:10.1057/jors.1984.101

Jackson, M. C. (1995). Beyond the fads: Systems thinking for managers. *Systems Research, 12*(1), 25-42. doi:10.1002/sres.3850120106

Jackson, N., & Carter, P. (1993). 'Paradigm wars': A response to hugh willmott. *Organization Studies, 14*(5), 721-725.

Joldersma, C., & Roelofs, E. (2004). The impact of soft OR-methods on problem structuring. *European Journal of Operational Research, 152*(3), 696-708. doi:10.1016/S0377-2217(03)00067-5

Kawalek, P., Wastell, D., & Newman, M. (2003). Problematisation and obfuscation in e-government. Paper presented at the *International Conference on Electronic Government,* 228-233.

Kelly, George Alexander,1905-1967., author. (2003). *The psychology of personal constructs*. London, UK: Routledge in association with the Centre for Personal Construct Psychology.

Keys, P. (2006). On becoming expert in the use of problem structuring methods. *Journal of the Operational Research Society, 57*(7), 822-829. doi:10.1057/palgrave.jors.2602194

Keys, P., & Midgley, G. (2002). Part special issue editorial: The process of OR. *The Journal of the Operational Research Society., 53*(2) doi:10.1057/palgrave.jors.2601313

Keys, P. (2007a). Developing a design science for the use of problem structuring methods. *Systemic Practice and Action Research, 20*(4), 333-349. doi:10.1007/s11213-007-9066-4

Keys, P. (2007b). Knowledge work, design science and problem structuring methodologies. *Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research, 24*(5), 523-535. doi:10.1002/sres.825

Keys, P. (2007c). Reducing the process lacuna in operational research by taking a knowledge work perspective. *Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research, 24*(3), 285-296.

Kieser, A., & Wellstein, B. (2008). Do activities of consultants and management scientists affect decision making by managers? *The oxford handbook of organizational decision making* ()

King, N., Brooks, J., & Tabari, S. (2018). Template analysis in business and management research. *Qualitative methodologies in organization studies* (pp. 179-206) Springer.

Klocker Larsen, R. (2011). Critical systems thinking for the facilitation of conservation planning in philippine coastal management. *Systems Research and Behavioral Science., 28*(1), 63-76. doi:10.1002/sres.1045

Lami, I. M., & Tavella, E. (2019). On the usefulness of soft OR models in decision making: A comparison of problem structuring methods supported and self-organized workshops. *European Journal of Operational Research, 275*(3), 1020-1036. doi:10.1016/j.ejor.2018.12.016

Lane, D. C. (1999). Social theory and system dynamics practice. *European Journal of Operational Research, 113*(3), 501-527.

Lane, D. C., Munro, E., & Husemann, E. (2016). *Blending systems thinking approaches for organisational analysis: Reviewing child protection in england*. Amsterdam] : Elsevier Science. doi:10.1016/j.ejor.2015.10.041

Ledington, P., & Ledington, J. (1999). The problem of comparison in soft systems methodology. *Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research, 16*(4), 329-339.

Lee, B., & Saunders, M. N. (2017). *Conducting case study research for business and management students* Sage.

Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2009). Playing it forward: Path dependency, progressive incrementalism, and the" super wicked" problem of global climate change. Paper presented at the *IOP Conference Series. Earth and Environmental Science, , 6*(50)

Lowe, D., & Yearworth, M. (2019). *Response to viewpoint: Whither problem structuring methods (PSMs)?*. Oxford, England ; New York : Published by Pergamon Press for Operational Research Society. doi:10.1080/01605682.2018.1502629

Luhmann Niklas. (2013). *Introduction to systems theory*. Cambridge, UK: Polity Press.

Luhmann, N. (1993). *The sociology of risk*. Berlin, Germany: der Gruyter.

Luhmann, N. (1995). *Social systems* Stanford University Press.

Luhmann, N. (2012a). *Theory of society* Stanford University Press.

Luhmann, N. (2012b). *Theory of society: Volume 1*. Stanford, California, USA: Stanford University Press.

Luhmann, N. (2013). *Theory of society, volume 2*. Stanford, California, USA: Stanford University Press. Retrieved from http://www.sup.org/books/title/?id=16878

Luhmann, N. (2018). *Organization and decision*. Cambridge, UK: Cambridge University Press.

Luhmann, N., & Rasch, W. (2002). *Theories of distinction: Redescribing the descriptions of modernity*. Stanford, California, USA: Stanford University Press.

MacIntyre, A. (2013). *After virtue*. London, UK: Duckworth.

Malik, F. (2020). World's leading company for holistic general management, leadership and governance solutions. Retrieved from https://www.malik-management.com/about-us/

Maturana, H. R. (1988). Ontology of observing: The biological foundations of self-consciousness. Retrieved from https://sites.evergreen.edu/arunchandra/wp-content/uploads/sites/395/2018/05/oo3.pdf

McClintock David, Ison Ray, & Armson Rosalind. (2003). *Metaphors for reflecting on research practice: Researching with people*. Abingdon, Oxfordshire, England : Carfax International Publishers for the University of Newcastle upon Tyne. doi:10.1080/0964056032000138454

McFadzean, E. (2000). Techniques to enhance creative thinking. *Team Performance Management: An International Journal,*

Meadows, D. H., Randers, J., & Meadows, D. L. (2005). *The limits to growth (1972) the thirty years update* (3rd ed.) Yale University Press.

Midgley, G. (1989). Critical systems and the problem of pluralism. *Cybernetics and Systems, 20*(3), 219-231.

Midgley, G. (1996a). The ideal of unity and the practice of pluralism in systems science. In L. Flood Robert, & R. A. Romm Norma (Eds.), *Critical systems thinking: Current research and practice* (pp. 25-36). New York, USA: Plenum Press. doi:10.1007/978-0-585-34651-9_1

Midgley, G. (1996b). What is this thing called CST? In L. Flood Robert, & R. A. Romm Norma (Eds.), *Critical systems thinking: Current research and*

practice (pp. 11-24). New York, USA: Plenum Press. doi:10.1007/978-0-585-34651-9_1

Midgley, G. (1997). Mixing methods: Developing systemic intervention. In Mingers, J & Gill, A (Ed.), *Multimethodology: The theory and practice of combining management science methodologies* (pp. 249-290). Chichester, England: Wiley.

Midgley, G. (2000). *Systemic intervention*. New York, USA: Kluwer.

Midgley, G. (Ed.). (2003). *Systems thinking*. London, England: Sage.

Midgley, G. (2008a). Response to paper “Systems thinking” by D. cabrera et al.:: The unification of systems thinking: Is there gold at the end of the rainbow? *Evaluation and Program Planning, 31*(3), 317-321. doi:10.1016/j.evalprogplan.2008.04.002

Midgley, G. (2008b). Systems thinking, complexity and the philosophy of science. *Emergence: Complexity and Organization, 10*(4), 55.

Midgley, G., Cavana, R. Y., Brocklesby, J., Foote, J. L., Wood, D. R., & Ahuriri-Driscoll, A. (2013a). Towards a new framework for evaluating systemic problem structuring methods. *European Journal of Operational Research, 229*(1), 143-154. doi:10.1016/j.ejor.2013.01.047

Midgley, G., Cavana, R. Y., Brocklesby, J., Foote, J. L., Wood, D. R., & Ahuriri-Driscoll, A. (2013b). Towards a new framework for evaluating systemic problem structuring methods. *European Journal of Operational Research, 229*(1), 143-154.

Midgley, G., Munlo, I., & Brown, M. (1998). The theory and practice of boundary critique: Developing housing services for older people. *Journal of the Operational Research Society, 49*(5), 467-478.

Midgley, G., Nicholson, J. D., & Brennan, R. (2017). Dealing with challenges to methodological pluralism: The paradigm problem, psychological resistance and cultural barriers. *Industrial Marketing Management, 62*, 150-159. doi:10.1177/1470593114538994

Miles, M. B., Huberman, A. M., & Saldaña, J. (2018). *Qualitative data analysis: A methods sourcebook* Sage publications.

Mingers, J., & Gill, A. (1997). *Multimethodology: The theory and practice of combining management science methodologies*. Chichester, England: Wiley.

Mingers, J. (1990). The what/how distinction and conceptual models: A reappraisal. *Journal of Applied Systems Analysis, 17*, 21-28.

Mingers, J. (1994). *Self-producing systems: Implications and applications of autopoiesis*. New York, USA: Springer Science & Business Media.

Mingers, J. (1997a). Multi-paradigm multimethodology. In Mingers, J & Gill, A (Ed.), *Multimethodology: The theory and practice of combining management science methodologies* (pp. 1-20). Chichester, England: Wiley.

Mingers, J. (1997b). Towards critical pluralism. In Mingers, J & Gill, A (Ed.), *Multimethodology: The theory and practice of combining management science methodologies* (pp. 407-440). Chichester, England: John Wiley and Sons.

Mingers, J. (2000a). The contribution of critical realism as an underpinning philosophy for OR/MS and systems. *Journal of the Operational Research Society, 51*(11), 1256-1270. doi:10.1057/palgrave.jors.2601033

Mingers, J. (2000b). *An idea ahead of its time: The history and development of soft systems methodology* Springer. doi:10.1023/A:1026475428221

Mingers, J. (2006). *Realising systems thinking: Knowledge and action in management science* Springer Science & Business Media.

Mingers, J. (2011). Soft OR comes of age—but not everywhere! *Omega, 39*(6), 729-741. doi:10.1016/j.omega.2011.01.005

Mingers, J. (2014). *Systems thinking, critical realism and philosophy: A confluence of ideas* Routledge.

Mingers, J., & Brocklesby, J. (1997). Multimethodology: Towards a framework for mixing methodologies. *Omega, 25*(5), 489-509.

Mingers, J., & Taylor, S. (1992). *The use of soft systems methodology in practice*. Oxford, England ; New York : Published by Pergamon Press for Operational Research Society. doi:10.1057/jors.1992.47

Mirijamdotter, A., & Bergvall-Kåreborn, B. (2006). An appreciative critique and refinement of checkland's soft systems methodology. *In search of an integrative vision for technology* (pp. 79-102) Springer.

Mitroff, I., & Linstone, H. (1993). *The unbounded mind: New thinking for the 21st century*. Oxford, UK: Oxford University Press.

Moeller Hans Georg. (2006). *Luhmann explained: From souls to systems*. Chicago, USA: Open Court Publishing.

Mohe, M., & Seidl, D. (2011). Theorizing the client—consultant relationship from the perspective of social-systems theory. *Organization (London, England), 18*(1), 3-22. doi:10.1177/1350508409353834

Morecroft, J. D. (2015). *Strategic modelling and business dynamics: A feedback systems approach* John Wiley & Sons.

Morgan, G., Gregory, F., & Roach, C. (1997). Images of organization.

Morgan, G., & Smircich, L. (1980). The case for qualitative research. *Academy of Management Review, 5*(4), 491-500.

Morrill, N. (2007). Are the benefits of PSMs being sold sufficiently: A practitioner's view. *The Journal of the Operational Research Society, 58*, 686. doi:10.1057/palgrave.jors.2602375

Morton, A., Ackermann, F., & Belton, V. (2007). Problem structuring without workshops? experiences with distributed interaction within a PSM process. *Journal of the Operational Research Society, 58*(5), 547-556.

Mulej, M., & Schwaninger, M. (2006). Design for viable organizations. *Kybernetes,*

Munro, E. (2011). *The munro review of child protection: Final report, a child-centred system* The Stationery Office.

Munro, I., & Mingers, J. (2002). The use of multimethodology in practice—results of a survey of practitioners. *Journal of the Operational Research Society, 53*(4), 369-378.

Naughton, J. (1977). *The checkland methodology: A reader's guide* (2nd ed.). Milton Keynes, UK: Open University Systems Group.

Nicholson, J. D., LaPlaca, P., Al-Abdin, A., Breese, R., & Khan, Z. (2018). What do introduction sections tell us about the intent of scholarly work: A contribution on contributions. *Industrial Marketing Management, 73*, 206-219. doi:10.1016/j.indmarman.2018.02.014

Nonaka, I., & Zhu, Z. (2012). *Pragmatic strategy: Eastern wisdom, global success* Cambridge University Press.

Nutt, P. C. (1984). Types of organizational decision processes. *Administrative Science Quarterly,* , 414-450.

Nutt, P. C., & Wilson, D. C. (2010). *Handbook of decision making*. Chichester, England: John Wiley & Sons.

Organisation for Economic Cooperation & Development (OECD). (2018). Embracing innovation in government: Global trends 2018. Retrieved from https://www.oecd.org/

Ormerod, R. (1995). Putting soft OR methods to work: Information systems strategy development at sainsbury's. *Journal of the Operational Research Society, 46*(3), 277-293.

Ormerod, R. (2017). Writing practitioner case studies to help behavioural OR researchers ground their theories: Application of the mangle

perspective. *Journal of the Operational Research Society, 68*(5), 507-520. doi:10.1057/s41274-016-0011-8

Ormerod, R. J. (2011). The relationship between operational research and systems thinking. *Journal of the Operational Research Society, 62*(1), 242-245. doi:10.1057/jors.2010.6

Ormerod, R. J. (2014). The mangle of OR practice: Towards more informative case studies of "technical" projects. *Journal of the Operational Research Society, 65*(8), 1245-1260. doi:10.1057/jors.2013.78

Ormerod, R. J. (2016). Critical rationalism for practice and its relationship to critical systems thinking. *Systems Research and Behavioral Science, 33*(1), 4-23. doi:10.1002/sres.2326

Ormerod, R. J. (2014). OR competences: The demands of problem structuring methods. *EURO Journal on Decision Processes, 2*(3-4), 313-340. doi:10.1007/s40070-013-0021-6

Ormerod, R. (2020). The history and ideas of sociological functionalism: Talcott parsons, modern sociological theory, and the relevance for OR. The Journal of the Operational Research Society, 71(12), 1873-1899. doi:10.1080/01605682.2019.1640590

Paucar-Caceres, A. (2010). Mapping the changes in management science: A review of ‘soft’ OR/MS articles published in omega (1973–2008). *Omega (Oxford), 38*(1), 46-56. doi:10.1016/j.omega.2009.04.001

Paucar-Caceres, A., & Jerardino-Wiesenborn, B. (2020). A bridge for two views: Checkland's soft systems methodology and Maturana's ontology of the observer. *The Journal of the Operational Research Society, 71*(4), 660-672. doi:10.1080/01605682.2019.1578629

Perlow, L. A., Okhuysen, G. A., & Repenning, N. P. (2002). The speed trap: Exploring the relationship between decision making and temporal context. *Academy of Management Journal, 45*(5), 931-955.

Pettigrew, A. M. (2001). Management research after modernism. *British Journal of Management, 12*(s1), S61-S70. doi:10.1111/1467-8551.12.s1.8

Pickering, A. (2010a). *The cybernetic brain: Sketches of another future*. Chicago, USA: University of Chicago Press.

Pickering, A. (2010b). *The mangle of practice: Time agency, and science.* Chicago, USA: University of Chicago Press.

Pollack, J. (2009). *Multimethodology in series and parallel: Strategic planning using hard and soft OR*. Oxford, England ; New York : Published by Pergamon Press for Operational Research Society. doi:10.1057/palgrave.jors.2602538

Popper, K. (2014). *Conjectures and refutations: The growth of scientific knowledge* routledge.

Preece, G., & Shaw, D. (2019). Structuring organisational information analysis through viable system model knowledge domains. *Journal of the Operational Research Society, 70*(2), 338-352.

Proctor, T. (2010). *Creative problem solving for managers: Developing skills for decision making and innovation* Routledge.

Rajagopalan, R., & Midgley, G. (2015). Knowing differently in systemic intervention. *Systems Research and Behavioral Science, 32*(5), 546-561. doi:10.1002/sres.2352

Ramage, Magnus, & Shipp. (2020). *Systems thinkers*. Milton Keynes, UK: OUP Springer.

Ranyard, J. C., Fildes, R., & Hu, T. (2015). Reassessing the scope of OR practice: The influences of problem structuring methods and the analytics movement. *European Journal of Operational Research, 245*(1), 1-13.

Reason, P., & Bradbury, H. (2001). *Handbook of action research: Participative inquiry and practice* Sage.

Reed, M. I. (1985). *Redirections in organizational analysis*. London: Tavistock.

Reichertz, J. (2013). Induction, deduction, abduction. In U. Flick (Ed.), *The SAGE handbook of qualitative data analysis.* (pp. 123-135). London: Sage.

Reynolds, M. (1998). *“Unfolding” natural resource-use information systems: Fieldwork in botswana* Springer. doi:10.1023/A:1022925317711

Richardson, G. P. (1991). *Feedback thought in social science and systems theory* University of Pennsylvania.

Rittel, H., & Webber, M. M. (1974). Wicked problems. *Man-made Futures,* , 272-280.

Robinson, S. (2004). *Simulation: The practice of model development and use*. Chichester, England: John Wiley & Sons Ltd.

Robinson, S. (2007). PSMs: Looking in from the outside. *Journal of the Operational Research Society,* , 689-691.

Rosenhead, J. (1989). *Rational analysis for a problematical world* (First ed.). Chichester, England: John Wiley & Sons Ltd.

Rosenhead, J. (1996). What's the problem? an introduction to problem structuring methods. *Interfaces, 26*(6), 117-131.

Rosenhead, J. (2006). Past, present and future of problem structuring methods. *Journal of the Operational Research Society, 57*(7), 759-765. doi:10.1057/palgrave.jors.2602206

Rosenhead, J., & Mingers, J. (2001). *Rational analysis for a problematic world revisited*. Chichester, England: John Wiley and Sons.

Roth, S. (2017). From added values to augmented realities. introducing the special issue of management and functional differentiation. *Systems Research and Behavioral Science, 34*(2), 131-138. doi:10.1002/sres.2447

Rousseau, D., & Wilby, J. (2014). Moving from disciplinarity to transdisciplinarity in the service of thrivable systems. *Systems Research and Behavioral Science, 31*(5), 666-677.

Rousseau, D., Wilby, J., Billingham, J., & Blachfellner, S. (2018). The potential of general systemology as a transdiscipline. *General systemology* (pp. 47-62) Springer. doi:10.1007/978-981-10-0892-4_3

Rutter, H., Cavill, N., Bauman, A., & Bull, F. (2019). Systems approaches to global and national physical activity plans. *Bulletin of the World Health Organization, 97*(2), 162.

Saaty, T. L. (1990). *Decision making for leaders: The analytic hierarchy process for decisions in a complex world*. Pittsburgh, USA: RWS publications.

Schegloff, E. A. (1991). Conversation analysis and socially shared cognition. *Perspectives on socially shared cognition* (pp. 150-171). Washington: American Psychological Association. doi:10.1037/10096-007 Retrieved from https://search.proquest.com/docview/614156372

Schein, E. H. (1999). *Process consultation revisited*. Reading, Mass. USA: Addison-Wesley.

Schon, D. A. (1983). *The reflective practitioner*. New York, USA: Basic Books.

Schwaninger, M., & Scheef, C. (2016). A test of the viable system model: Theoretical claim vs. empirical evidence. *Cybernetics and Systems, 47*(7), 544-569.

SeeNews. (2020). Armatura SA. Retrieved from https://seenews.com/companies/company_profile/armatura-sa-1795

Seidl, D., & Becker, K. H. (2006). Organizations as distinction generating and processing systems: Niklas luhmann's contribution to organization studies. *Organization (London, England), 13*(1), 9-35. doi:10.1177/1350508406059635

Seidl, D., & Mormann, H. (2014). Niklas luhmann as organization theorist. *The Oxford Handbook of Sociology, Social Theory, and Organization Studies: Contemporary Currents,* , 125-157.

Senge, P. M. (2014). *The fifth discipline fieldbook: Strategies and tools for building a learning organization*. London, UK: Crown Business.

Siggelkow, N. (2007). Persuasion with case studies. *Academy of Management Journal, 50*(1), 20-24.

Simon, H., & March, J. (1976). Administrative behavior and organizations.

Sinek, S. (2014). *Leaders eat last : Why some teams pull together and others don't*. London: Portfolio Penguin.

Siriram, R. (2019). Factors affecting the adoption of systems thinking. *Systems Research and Behavioral Science,*

Slack, N., Betts, A., Brandon-Jones, A., & Johnston, R. (2015). *Operations and process management: Principles and practice for strategic impact* (Fourth edition ed.). Harlow, United Kingdom: Pearson Education Limited.

Smith, C. M., & Shaw, D. (2019). The characteristics of problem structuring methods: A literature review. *European Journal of Operational Research, 274*(2), 403-416. doi:10.1016/j.ejor.2018.05.003

Spencer-Brown George. (1969). *Laws of form*. New York, USA: Julian Press.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, California: Sage.

Stake, R. E. (2013). *Multiple case study analysis*. London, UK: Guilford press.

Starkey, K., Hatchuel, A., & Tempest, S. (2009). *Management research and the new logics of discovery and engagement*. Oxford: Blackwell Publishers. doi:10.1111/j.1467-6486.2009.00833.x

Sterman, J. D. (2000). *Business dynamics: Systems thinking and modeling for a complex world* Irwin/McGraw-Hill Boston.

Stowell, F. A., & Welch Christine. (2012). *The manager's guide to systems practice making sense of complex problems*. Chichester, England: John Wiley & Sons.

Sturdy, A. (1997). The consultancy process - an insecure business? *Journal of Management Studies, 34*(3), 389-413. doi:10.1111/1467-6486.00056

Suddaby, R. (2006). From the editors: What grounded theory is not. *The Academy of Management Journal., 49*(4), 633-642. doi:10.5465/amj.2006.22083020

Swantz, M. L., Reason, P., & Bradbury, H. (2008). Participatory action research as practice. *The SAGE Handbook of Action Research: Participative Inquiry and Practice,* , 31-48.

Sweeney, L. B., & Sterman, J. D. (2000). Bathtub dynamics: Initial results of a systems thinking inventory. *System Dynamics Review: The Journal of the System Dynamics Society, 16*(4), 249-286.

Sydelko, P., Midgley, G., & Espinosa, A. (2021). Designing interagency responses to wicked problems: Creating a common, cross-agency understanding. *European Journal of Operational Research, 294*(1), 250-263.

Tavella, E. (2018). *On novice facilitators doing research-research in problem structuring methods as autoethnography*. Chichester, W. Sussex, England] : John Wiley & Sons. doi:10.1002/sres.2438

Tavella, E., & Papadopoulos, T. (2015). Novice facilitators and the use of scripts for managing facilitated modelling workshops. *The Journal of the Operational Research Society., 66*(12), 1967-1988. doi:10.1057/jors.2015.7

The Economist Newspaper. (2018,). Romania has a city it can boast about. *The Economist* Retrieved from https://www.eceonomist.com/europe/2018/12/22/romania-has-a-city-it-can-boast-about

Tranfield, D., & Starkey, K. (1998). The nature, social organization and promotion of management research: Towards policy. *British Journal of Management, 9*(4), 341-353. doi:10.1111/1467-8551.00103

Tsoukas, H. (1993). “By their fruits ye shall know them”: A reply to jackson, green, and midgley. *Systems Practice, 6*(3), 311-317.

Tsouvalis, C., & Checkland, P. (1996). Reflecting on SSM: The dividing line between ‘real world’and ‘systems thinking world’. *Systems Research, 13*(1), 35-45. doi:10.1002/(SICI)1099-1735(199603)13:1<35::AID-SRES73>3.0.CO;2-O

Tully, P., White, L., & Yearworth, M. (2019). The value paradox of problem structuring methods. *Systems Research and Behavioral Science, 36*(4), 424-444. doi:10.1002/sres.2557

Ulrich, W. (2003). *Beyond methodology choice: Critical systems thinking as critically systemic discourse*. Oxford, England ; New York : Published by Pergamon Press for Operational Research Society. doi:10.1057/palgrave.jors.2601518

Ulrich, W. (1983). Critical heuristics of social planning: A new approach to practical philosophy.

Ulrich, W., & Reynolds, M. (2010). Critical systems heuristics. In Reynolds Martin, & Holwell Sue (Eds.), *Systems approaches to managing change: A practical guide* (pp. 243-292). London, UK: Springer.

UN. (2017). United nations systems leadership framework. Retrieved from https://unsceb.org/united-nations-system-leadership-framework

Van Aken, J., Chandrasekaran, A., & Halman, J. (2016). Conducting and publishing design science research: Inaugural essay of the design science department of the journal of operations management. *Journal of Operations Management, 47*, 1-8. doi:10.1016/j.jom.2016.06.004

Van de Ven, A.,H. (1989). *Nothing is quite so practical as a good theory*. Mississippi State, Miss. : Academy of Management. doi:10.5465/amr.1989.4308370

Van de Ven, A.,H., Meyer, A. D., & Jing, R. (2018). *Opportunities and challenges of engaged indigenous scholarship*. Oxford : Blackwell Pub. doi:10.1017/mor.2018.28

Velez-Castiblanco, J., Brocklesby, J., & Midgley, G. (2016). Boundary games: How teams of OR practitioners explore the boundaries of

intervention. *European Journal of Operational Research, 249*(3), 968-982. doi:10.1016/j.ejor.2015.08.006

Vennix, J. A. M. (1995). Building consensus in strategic decision-making : System dynamics as a group support system. *Group Decision and Negotiation, 4*, 335-355.

Vickers, G. (1995). *The art of judgment: A study of policy making*. Thousand Oaks: Sage.

Von Bertalanffy, L. (1968). *General systems theory*. London, UK: Penguin.

Von Bertalanffy, L. (1972). The meaning of general system theory. *General System Theory: Foundations, Development, Applications,* , 30-53.

Von Foerster, H. (1984). *Observing systems* (2nd ed.). Seaside, California, USA: Intersystems publications.

Von Foerster, H. (2003). Ethics and second-order cybernetics. *Understanding understanding* (pp. 287-304) Springer.

Warren, K. (2004). Why has feedback systems thinking struggled to influence strategy and policy formulation? suggestive evidence, explanations and solutions. *Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research, 21*(4), 331-347. doi:10.1002/sres.651

Westcombe, M., Franco, L. A., & Shaw, D. (2006). Where next for PSMs: A grassroots revolution? *Journal of the Operational Research Society, 57*(7), 776-778. doi:10.1057/palgrave.jors.2602161

White, L. (2006). Evaluating problem-structuring methods: Developing an approach to show the value and effectiveness of PSMs. *Journal of the Operational Research Society, 57*(7), 842-855. doi:10.1057/palgrave.jors.2602149

White, L., Yearworth, M., & Burger, K. (2015). Understanding PSM interventions through sense-making and the mangle of practice lens. Paper presented at the *International Conference on Group Decision and Negotiation,* 13-27.

Wilson Brian. (2001). *Soft systems methodology conceptual model building and its contribution* . Chichester, England: Wiley.

Wilson, B., & Van Haperen, K. (2015). *Soft systems thinking, methodology and the management of change*. London, UK: Palgrave Macmillan.

Yearworth, M., & White, L. (2014). The non-codified use of problem structuring methods and the need for a generic constitutive definition. *European Journal of Operational Research, 237*(3), 932-945. doi:10.1016/j.ejor.2014.02.015

Yin, R. K. (2018). Case study research and applications. *Design and Methods, 6*

Zhu, Z. (2011). After paradigm: Why mixing-methodology theorising fails and how to make it work again. *Journal of the Operational Research Society, 62*(4), 784-798. doi:10.1057/jors.2010.31