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How to Manage Complex Problem Conditions

Posted on [December 8, 2015](#) by [Olivia Wright](#)

A Social Services Perspective

by Robert Flynn & Kerry Graham

1.0 INTRODUCTION

We have written this short article with a specific audience in mind, namely those of you in social change leadership roles in Australia-NZ. We know that you have to deal with an increasing number and variety of complex problem situations. We know that most of you are familiar with the fact that successfully resolving complex problems requires a '*different way of thinking*', and the adoption of problem-solving methods different from those that served you well in less complex times. We also know that most of you struggle with three associated questions:

1. Exactly what is the necessary 'way of thinking'?
2. What are the required problem-solving methods?
3. How do I go about translating the theory into practical, actionable steps?

In the remainder of the article we will attempt to answer each in turn.

2.0 A DIFFERENT WAY OF THINKING

To understand what this different mode of thinking is all about, it is useful to begin by recognising the fundamentally important distinction between *complicated* and *complex* problem situations. Many of us tend to conflate the two, and use them interchangeably in everyday conversation. There is, however, an important technical difference between the two problem

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categories. For its part, a **complicated** problem is one for which there is a definitive, correct answer. You may not know what it is, but somebody does, perhaps a subject-matter expert. For example, if asked “What is the value of x when $ax^2 + bx + c = 0$?”, your algebra (like ours) may no longer stretch far enough to provide the correct answer. But any competent mathematician will immediately recognise the quadratic equation and give you the answer. By way of contrast, here are some of the defining characteristics of a genuinely **complex** problem:

- There is no agreed or ‘correct’ view of the problem situation. There are simply different perceptions of what it is or might be.
- The situation can appear to have elements in it that are illogical or ‘a-logical’.
- There are multiple stakeholders with wide-ranging, and often apparently irreconcilable, expectations and aspirations.
- Operating conditions are being influenced by a range of social or cultural intricacies.
- The environment within which the problem situation exists is ‘politically charged’ – either in large P or small p terms.
- The problem situation does not appear to have any obvious resolution, or it may appear to have several competing solutions none of which is particularly appealing.
- The risk profile associated with it is a cause for concern, but does not lend itself to easy assessment or measurement.
- Reliable data relating to the situation are either totally absent or difficult to pinpoint.

Again, by way of illustration, and by way of providing a clear distinction between this and the quadratic equation example, consider the following: “Here’s a bunch of four-year olds. Your task is to control their behaviour for the next four hours, and to do so with absolute certainty and predictability.” Need we say more.

With the above distinction in mind, we can now see that a form of thinking known as ‘linear-rational’ works fine for complicated problem situations. There is a definitive solution; it is just a question of knowing where to find it. Mathematical rigour, rational thought, pre-existing knowledge, the availability of tried and tested algorithms, access to subject-matter experts – all of these can be engaged to quickly discover the definitive solution.

Not so with a complex problem situation. There is no definitive solution. In fact, we are not even sure exactly how to describe the problem condition. To make matters worse, different stakeholders may have entirely different interpretations, not to mention different ultimate agendas and conflicting expectations. Now we are in the realm of complexity, and the required mode of thinking is known as ‘non-linear, dynamic and reflexive’. The term ‘non-linear’ means that cause and effect patterns will not necessarily follow a logical cause-effect sequence. ‘Dynamic’ means that the nature and scope of the problem may very well be changing in front of our eyes. ‘Reflexivity’ –

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at least in the social theory context – represents an extension of the notion of non-linearity. It means that circular relationships may exist between cause and effect. A leads to B, B leads to C, C leads to D – but then D angles back and changes A. The current entry in Wikipedia puts it nicely: “A reflexive relationship is bidirectional with both the cause and the effect affecting one another in a relationship in which neither can be assigned as causes or effects.” This provides an insight into why those trained in the natural sciences and engineering disciplines often struggle so much with complex problems. They are expecting logic and linearity; what they encounter is anything but.



So, we have now answered the first of the three questions posed earlier. The necessary mode of thinking that you need to adopt and master for of complex problem situations, is that known as non-linear, dynamic and reflexive. All very well and good you might say, but that sounds awfully theoretical and academic. So, let us take a look at some conceptual frameworks that enable us to put this mode of thinking into actual practice.

3.0 PROVEN METHODS FOR DEALING WITH COMPLEX PROBLEM SITUATIONS

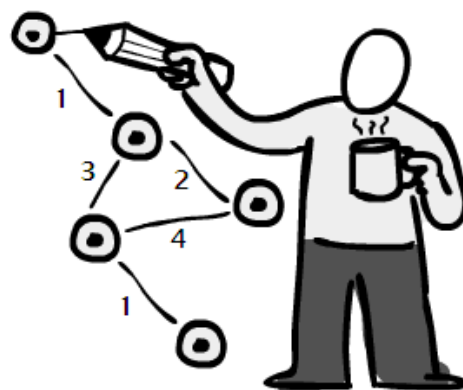
Some of you will have taken the trouble to delve into the literature on how to deal with complex problem situations. You most likely will have discovered that the experts suggest that you draw on the techniques and tools of ‘complexity science’. While indeed accurate on one level, this can prove off-putting for busy leaders grappling with actual real-world complexity. A hint as to the reason why can be found in the very definition of complexity science, namely, an inter-disciplinary body of knowledge drawn from the natural sciences, the systems sciences, the social sciences, and the humanities. Included in the mix you’ll find such diverse disciplines as fractal geometry, chaos theory, cybernetics, complex adaptive systems theory, anthropology, psychology, sociology, cognitive science and hermeneutics. Having discovered this the busy leader is likely to go “Whew, Jeez – I have neither the time nor inclination to try to disentangle all that!”

One of us (Robert) has been working on complex problem conditions in the corporate sector over the past ten years, specifically in those industries that

require high-reliability performance because of their propensity for catastrophic failures – sectors such as oil & gas, mining, nuclear energy, aerospace, and large-scale commercial and infrastructure construction. The other (Kerry) is a long-time consultant and adviser to the social services sector in Australia and New Zealand. Earlier this year we connected through a shared interest in concepts such as complexity, agility, creativity and innovation. On putting our heads together over the intervening months, we have come up with a more practical (and hopefully less daunting) outline of what needs to be in place to promote and facilitate non-linear thinking. We believe there are four things, the first of which is cultural, the remaining three being, shall we say, conceptual-procedural.

The requisite cultural foundation is one that promotes and facilitates collaborative enquiry. Single individuals, working alone, rarely make much progress when working on complex problem situations. The reasons for this are well known and well documented in the wider complexity literature, so need not take up space here. Assuming the correct cultural foundation, then those wishing to master the challenge of effectively handling wicked problem scenarios need to develop two non-negotiable skill-sets, meaning, if you cannot master them you are unlikely to ever get on top of complex problems. The skill-sets are:

1. Those involved in the discipline of *Critical Analysis*
2. Those involved in constructing *emblematic (visual) models* of system performance.



Critical Analysis

There are two meanings we tend to associate with the word *critical*. One is captured in the notion *to criticise*, where the intention is to censure the other party. The other is to *offer a critique*, meaning, to examine something in a systematic way in order to understand or interpret it better. The concept of Critical Thinking (CT) is very much about the latter. In a nutshell, somebody adept at CT can be expected to demonstrate greater insight into, and interpretation of, complex problem situations. As someone nicely put it: “CT represents a persistent effort to examine any belief or supposed form of knowledge in the light of evidence that supports or refutes it and the further conclusions to which it tends.”

Being good at CT means you have developed the capacity to do the following on a consistent basis,

- Correctly distinguish between complicated and complex problem types
- Identify relevant data points and turn them into workable information
- Recognise unstated assumptions, beliefs and values, and challenge them when unwarranted
- Identify the existence or otherwise of logical connections between propositions
- Draw correct and well-informed conclusions as to what actions are required, remedial and/or developmental.

Some readers might think that any reasonably well-educated person, and not least those in organisational leadership roles, will possess these five qualities. In our combined experience, of both the corporate and social services sectors, we can state with absolute confidence that this is not the case. Over the years we have seen countless examples of well-educated people, with high IQs, do one or other of the following:

- Miss or willfully ignore key data points relevant to a given issue
- Make and act upon outrageously wrong assumptions
- Draw convenient conclusions, consciously or unconsciously
- Fail to anticipate potential unintended consequences
- Ignore the difference between convenient lies and difficult truths
- Fail to identify and interpret emergent social, political, economic and other patterns resulting from the interaction of people, circumstances and issues that make up their communal reality
- Fail to identify how these patterns are likely to play out in their forward trajectories.

So, the question is: Can you learn the skills needed to become a proficient critical thinker? The answer of course is yes.

Emblematic Modelling

Emblematic Modelling is a generic term covering a variety of methods through which the functioning of socio-economic systems can be visually represented. Just about everything written on the topic of 'managing complexity' makes explicit, from the outset, the fact that the non-negotiable starting point always involves taking a 'systems perspective' of the challenge under consideration. Our experience of working in the social services sector tells us that most of you in leadership roles are already aware of this, and accept the underlying logic. But it also tells us that many of you encounter difficulty in translating the theory of *Systems Thinking* into actual practice. Time and space prevent us here from providing a detailed account of all the techniques that can be employed in order to model system behaviour. We wish to focus on just two, but two we believe are especially relevant to our context.

HAS (Human Activity System) Modelling is a technique drawn from a comprehensive methodology called *Soft Systems Analysis*. The ability to produce HAS models offers the substantial benefit of enabling those who are trying to improve system performance to map out the key components of that system in a visual (or emblematic) model that contains no more than nine actionable elements. The rationale behind this, drawn from cognitive psychology, is that most of us have the intellectual capacity to juggle simultaneously up to nine variables. More importantly, however, we are able to grasp the systemic interplay of these nine variables in terms of cause-effect structures. Careful study of the resultant model then enables us to determine, both quickly and accurately, where the high-leverage intervention point lies for improving performance of the system in question.

A second type of emblematic modelling is available to us in the form of **Causal Loop Analysis**. This is an extremely powerful technique when our focus is on trying to identify the root cause of a complex problematic condition. While it is sometimes necessary to quickly apply a band-aid solution to a symptomatic manifestation of a problem condition, it is more often the case that dealing with the root cause provides the more lasting and comprehensive solution. It is our experience that one reason why so many leaders prefer to opt for the band-aid fix, is because they do not know how to provide sufficient evidentiary support for the ‘gut-feeling’ that a fundamental fix is what is really needed. Producing causal loop diagrams can be counted on to provide the necessary evidence.

Two questions now arise, of course: (i) Can I learn how to construct emblematic models?; and (ii) How difficult is it to master the art? The answer to the former is also a resounding yes. Regarding the latter, it is fair to say that neither HAS Modelling nor Causal Loop Modelling are intuitively easy to master for many people. It is not the case that either of them constitutes ‘*rocket science*’ from an intellectual perspective. Instead it boils down to aptitude. Some people are just hard-wired, intellectually and emotionally, for the challenge of building excellent emblematic models. As relevant research tells us, the good news is approximately 25% of any population group fall into this category. Therefore, even if your organization employs as few as twenty individuals, five of them are likely to possess the requisite wiring. (Those of you who map out as INTP on Myers-Briggs, or as Types 5 or 7 on the Enneagram, usually can be counted on to fit the bill!)

4.0 MOVING TO PRACTICAL, ACTIONABLE STEPS

Unless you are extremely lucky, you cannot expect to *solve* a truly complex problem in the sense that you can solve a complicated one. Some authors suggest the use of the word ‘resolve’ as a more appropriate alternative. We favour the idea of dissolution. In essence, you work on the problematic condition so that you progressively dissolve the ‘wickedness’ into some form of tameness or docility. The extent to which you can minimise the

timeframe needed to get to this point will be determined by the extent to which you have mastered a process we call *Dissolution Mapping*. Here is a short account of one of our favourite models for doing this:

When faced with a truly complex problem condition, the astute leader will commission two syndicates. One is given the brief:

Build a comprehensive and accurate account of the problem condition, using the techniques of Critical Analysis and Emblematic Modelling.

The other syndicate is given the following terms of reference:

Assume the problem condition, as we understand it, magically disappeared at midnight last night. Design a cultural and operational blueprint that will ensure we never allow this condition to emerge again.

Each syndicate, ideally consisting of between five and eight members, is then instructed to work on its task for a nominated period of time, say three weeks. During this period they may not cross-interact with each other. Each syndicate is self-organising in terms of how it goes about its work in relation to logistics and other considerations. At the end of the nominated period, the syndicates convene for a joint workshop in which each presents its findings and conclusions to the other. We have now arrived at a point where we have two quite different accounts of our complex problem situation: one presenting a systematic and systemic account of the condition; the other presenting an idealised solution design. Following these presentations, the syndicates now merge and begin working on a final dissolution pathway, one which will be informed by both an accurate account of current reality, and a second informed by the powerful concepts underpinning the notion of Design Thinking. Again, our preferred model for Dissolution Mapping offers clear and explicit guidelines on how to bring this process to closure.

5.0 CONCLUDING COMMENTS

We hope the reader can appreciate that in this article we have only given a high level account of the many practical techniques and methods available for dealing with complex problems. We especially hope that those of you who, up to this point, may have been totally confused by the challenge can now take heart. In the social services context, you just need to learn how to master three things: Critical Analysis; Emblematic Modelling; and Dissolution Mapping. Not everyone will have the natural aptitude for the task, but plenty will. Chances are you are one or have some of them on your payroll.

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