Soft systems approaches*

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The idea of a 'soft systems methodology' (SSM) was developed by Peter Checkland, Professor of Systems at Lancaster University (Checkland, 1999). It has been extended by his colleague, Brian Wilson (1984), to the management of information systems and developed by the Open University Systems Group as one of three key approaches to be used in 'systems thinking'. (The others are the 'hard' and the 'failures' approaches.) In describing soft systems approaches I will draw mainly on the work of Peter Checkland but also on the work of his colleague and of the Open University. At times I will offer my own interpretation of what might be entailed in a 'soft' systems approach.

'Soft' and 'hard' systems

I take a 'hard' system to be one about which there are no value disagreements. Traditionally, 'hard' has been applied to engineering or chemical systems designed to deal with physical objects; but there are sometimes value disagreements about such systems, e.g. a nuclear power station, which cannot be handled within traditional 'hard' systems approaches.

Traditionally, 'soft' has been applied to human or social systems. However, where there are no value disagreements in such situations a traditional 'hard' systems approach may work well. In adopting a definition of a 'soft' system as one about which there are or are likely to be value disagreements, I am going further than the existing literature and readers need to be aware that 'hard' and 'soft' are not used in this way in many systems texts.

'Human activity systems'

Checkland began to develop his ideas about a 'soft systems methodology' when he moved from ICI to Lancaster and realised that there was no language in management literature to describe what was going on in the sort of business he had come from. A similar conclusion is reached by de Greene (1982) in his survey of ways of thinking about organisations and in particular large organisations like the NASA space programme.

Out of this realisation Checkland coined the idea of a 'human activity system', in which a number of human beings act together to achieve something. Sometimes 'human activity system' is used almost interchangeably with 'soft' system but, as I have suggested above, it may be better to regard 'human activity systems' as sometimes 'soft' systems and sometimes 'hard' systems in the sense that a group of human beings may have no value disagreements in

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relation to a particular activity and it may therefore be reasonable to apply a 'hard' systems approach to the analysis of that activity system.

'Real world' and 'systems thinking'

Checkland argues that any 'system' is a way of thinking about the real world adopted by the analyst. Though we use the word 'system' to apply to 'hard', 'concrete', 'material' systems in the real world, each such use of the word 'system' depends on the speaker having a concept of the 'system' s/he is describing. However, rather than get bogged down in the distinction between 'objective' and 'subjective' reality, Checkland argues that both are required by a systems thinker. Without the 'objective' reality, there is nothing to think about; without the 'subjective' thinking, there is no way of describing the 'objective' reality. He incorporates this concept in his methodology by describing some of the stages as being 'in' the 'real world' and some as being 'in' the world of 'systems thinking'. Thus, a 'problem' in the 'real world' may be considered in the 'abstract' world of 'systems thinking' and a 'solution' derived via an abstract process of thought must be brought back to the 'real world' for it to be applied to the 'problem'.

'Problem' and 'solution'

Checkland freely uses the words 'problem' and 'solution' even though Vickers and the Open University Systems Group have abandoned them. Checkland himself provides one argument against their use. The idea of a 'problem' comes from medieval debates — it was the 'thing put forward' for debate, e.g. angels dancing on a pin-head. Checkland has argued that this idea of a 'thing put forward' became the 'problem' to which professionals could apply their particular expertise. However, as Vickers has argued, formulating the work of professionals in terms of 'problems' that have 'solutions' creates unreal expectations of professional activity and denies alternative focuses of professional activity.

Many of the activities of professionals should not be seen as addressing 'problems' which have 'solutions'. For example, in social work it has become a cliché to refer to social work as a 'problem solving process'. However this view of social work tends to exclude or devalue preventive work or developmental work, e.g. with a child or an elderly person.

The Open University has adopted the idea of an 'opportunity' situation, rather than a 'problem', to get away from the difficulty of describing all situations as 'problems'. This gets away from the idea that there is always a 'solution' and fits better both with Checkland's methodology and the idea of 'equifinality' — that there will always be more than one way of reaching a satisfactory outcome.

The analyst and the organisation

Checkland takes for granted that the analyst's entry into an organisation changes that organisation. The Open University Systems Group goes further in asking anyone who 'analyses' a system to place themselves 'in' the system they are analysing.

Checkland argues that the success of his methodology depends on the analyst sharing the methodology and the progress of the analysis with the people in the organisation. He also anticipates that this process will change the views of the people in the organisation and therefore require the analyst to revise parts of the analysis. He therefore emphasises iteration as an

integral part of the approach, particularly after stage 5 when the analyst may move to stage 2 and repeat the conceptual analysis of the system.

At the end the analyst may embark on a new analysis of the changed situation. Indeed, people who use the 'soft systems methodology' to apply to their own workplace are likely to go through many iterations as their work and/or external demands change the demands on the organisation.

The Checkland methodology

An outline of the seven stages of Checkland's 'soft systems methodology' is given below and in figure 1 on the following page. Figure 1 identifies which stages of the methodology are undertaken in the 'real world' and in conjunction with members of the organisation under study and which are undertaken by the analyst using the formal language of 'systems thinking'.

Stage 1: the opportunity or 'problem' situation

Any systems thinking begins with the identification of a real world situation about which one wishes to think. Usually, we think about these situations because we want to change them; but sometimes we simply want to understand them. Whatever the case, the act of choosing the situation is itself bound to change the situation.

In traditional systems thinking, this choice is made by the 'client' who sponsors the study and the study only addresses the 'problem' as defined by the 'client'. As will be seen later, though the situation to be studied may be outlined by the client, Checkland does not expect the analyst necessarily to adopt the client's definition of the situation.

Stage 2: the situation expressed

Checkland has developed a technique called the 'rich picture' to describe the real world situation one wishes to study. This technique has been developed by the Open University and I would also support its use as a way of expressing the relationships in a situation. The technique could be seen as a pictorial extension of Buzan drawings Buzan (2003) though it predates Buzan.

Briefly, the analyst seeks to develop a pictorial representation of all the elements in the situation. This is a rough and ready drawing with pictorial elements unsorted and connections described in a very rudimentary way. The important things are to include all the elements in the situation, whether 'concrete' or 'abstract' and all the relationships between the elements in the situation.

A rich picture can often be used by an analyst to check with people in a situation that the analyst has understood their situation. People will often expand on or clarify or correct elements of a 'rich picture' if it is shown to them or discussed with them.

Stage 3: creating 'root definitions' of 'relevant systems'

Once the analyst is satisfied that s/he has a sufficient grasp of the 'real world' situation, s/he abandons 'real world' representations of the situation for more formal systemic representations. Because any 'real world' situation can be viewed from many different angles, the number of systemic representations of the 'real world' that might be constructed by an analyst may be infinite; it is therefore very important to identify what might be 'relevant' systems.

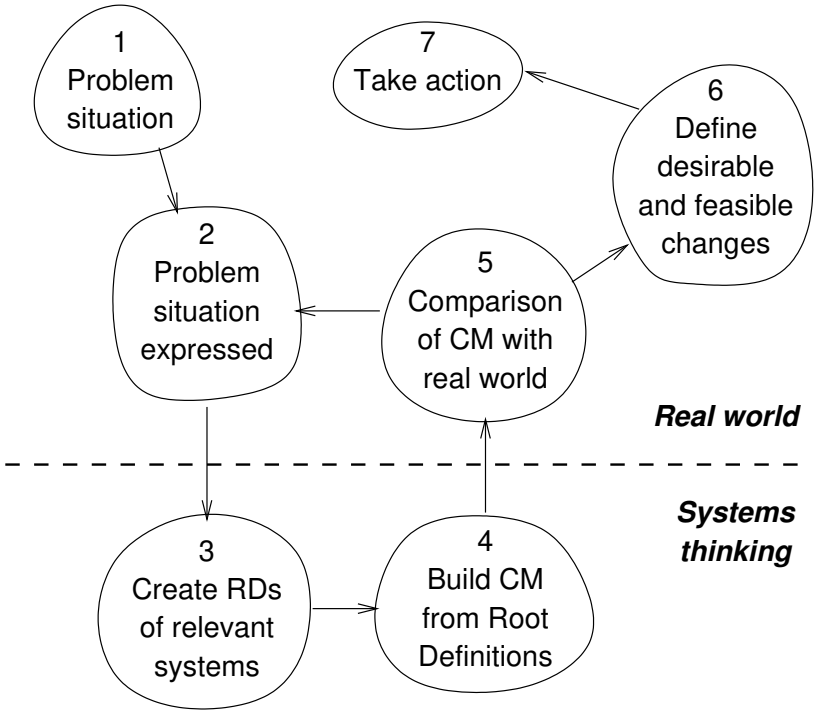

Figure 1: Outline of the Checkland methodology

'Relevance' is a subjective concept so Checkland suggests the analyst identifies several potentially 'relevant' systems. Eventually, their relevance will be tested when the analyst returns to the 'real world' for the stage 5 comparison.

Having identified several 'relevant systems', the analyst creates a 'root definition' (RD) of the system and tests it against a CATWOE analysis (see separate handout on 'Root Definitions and Conceptual Models'). It is often useful to begin 'root definitions' of several 'relevant systems' but only develop one completely.

Stage 4: building 'conceptual models' from 'root definitions'

'Soft systems methodology' was developed to describe 'human activity systems', so Checkland draws on the 'activities' of the system at this stage. Each 'element' of the 'conceptual model' (CM) of the system is an *activity* and therefore contains a *verb*. Checkland encourages the analyst to use the verbs in the 'root definition' and to create English-like sentences to describe the relationships between the elements in the system.

It is important at this stage to identify how the system 'communicates' and 'controls' its behaviour. A system without a feedback or a control mechanism will continue for ever even when the activities it was set up to perform are no longer required. So the 'conceptual model' must include an account of how the system communicates between its elements and how it controls its own performance.

To assist with this stage Checkland provides a 'formal systems model' against which the analyst can check his/her 'conceptual model'.

Stage 5: comparison of 'conceptual model' with 'real world'

Moving back from the world of 'systems thinking' the analyst now compares the 'conceptual model' with the 'rich picture' completed at Stage 2 and discusses the implications of that comparison with the people in the 'real world' situation.

This may provoke one or more iterations of stages 2, 3 and 4 because, for example, 'real world' elements were missing at stage 2 or the 'relevant system' chosen at stage 3 was less relevant than the analyst thought or the people in the 'real world', having seen the results of the first cycle, decide the situation has changed (more common than you might think!).

However, at some point, perhaps immediately, perhaps after several iterations, the comparison of the 'conceptual model' developed at stage 4 with the 'real world' situation outlined at stage 2 will be close enough to warrant moving on to stage 6.

Stage 6: define desirable and feasible changes

Simply ending with a list of changes after stage 5 is futile; some changes could make things worse; some would be unacceptable to people in the 'real world'. So each change must be analysed and discussed to ensure it is both *systemically* desirable and *culturally* feasible.

For example, a few years ago the CQSW course at Huddersfield Polytechnic responded to a rise in applications by writing to applicants suggesting they consider withdrawing their applications or applying elsewhere. Far from reducing the number of applications, this made applicants aware of the popularity of the course and increased their determination to apply — a systemically undesirable outcome.

Though 'soft systems methodology' attempts to encompass the subjective views of those in the 'real world', these may not always be apparent at the start of the analysis and some changes may not be culturally feasible — e.g. a change in the job responsibilities of someone who has just accepted new conditions of employment or eradicating sexist behaviour overnight in a traditionally male dominated organisation.

The importance of this stage is demonstrated by the evidence that less than 10% of traditional systems analyses are implemented. The blame for this has usually been laid on the analysis and greater emphasis has been placed on the 'front end' of the analysis. However, Blackler and Brown (1987) argue that implementation strategies are at least as important as the analysis itself and Checkland recognises this in making stages 6 and 7 parts of the methodology.

Stage 7: taking action

At this stage everyone must be clear about the action they are taking to implement the changes agreed at stage 6. Checkland suggests that commitment to these changes will be greater if people have been involved throughout the analysis and in particular at stages 2, 5 and 6. Of the possible actions at this stage may be a new analysis of a related aspect of the organisation. The cycle begins again.

Addendum

Since this handout was last revised in 1989, Checkland has published two further books on SSM (Checkland and Scholes, 1990; Checkland, 1999) and, at a Colloquium in his honour held

at Lancaster University on 20 April 2012, presented a summary of his thinking about SSM (figure 2 on the next page).

References

Blackler, F. and C. Brown (1987). Management, organizations and the new technologies. In F. Blackler and D. Oborne (Eds.), *Information technology and people: designing for the future*, Chapter 2, pp. 23–42. Leicester: British Psychological Society.

Buzan, T. (2003). *Use your head* (Revised ed.). London: BBC Worldwide.

Checkland, P. (1999). *Soft systems methodology: a 30 year retrospective and systems thinking, systems practice*. Chichester: Wiley.

Checkland, P. and J. Scholes (1990). *Soft Systems Methodology in Action*. Chichester: Wiley.

Greene, K. B. de. (1982). *Adaptive organizations: anticipation and management of crisis*. Chichester: Wiley.

Wilson, B. (1984). *Systems: concepts, methodologies and applications*. Chichester: Wiley.

Abbreviations and jargon commonly used in the soft systems literature

CATWOE a mnemonic for

Customers

Actors

Transformation

Weltanschauung

Owner

Environment

used to test 'root definitions'

CM conceptual model

HAS human activity system

RAND the RAND Corporation and their 'hard' systems approach which has been widely used over the past forty years

RD root definition

SSM soft systems methodology (specifically Checkland's)

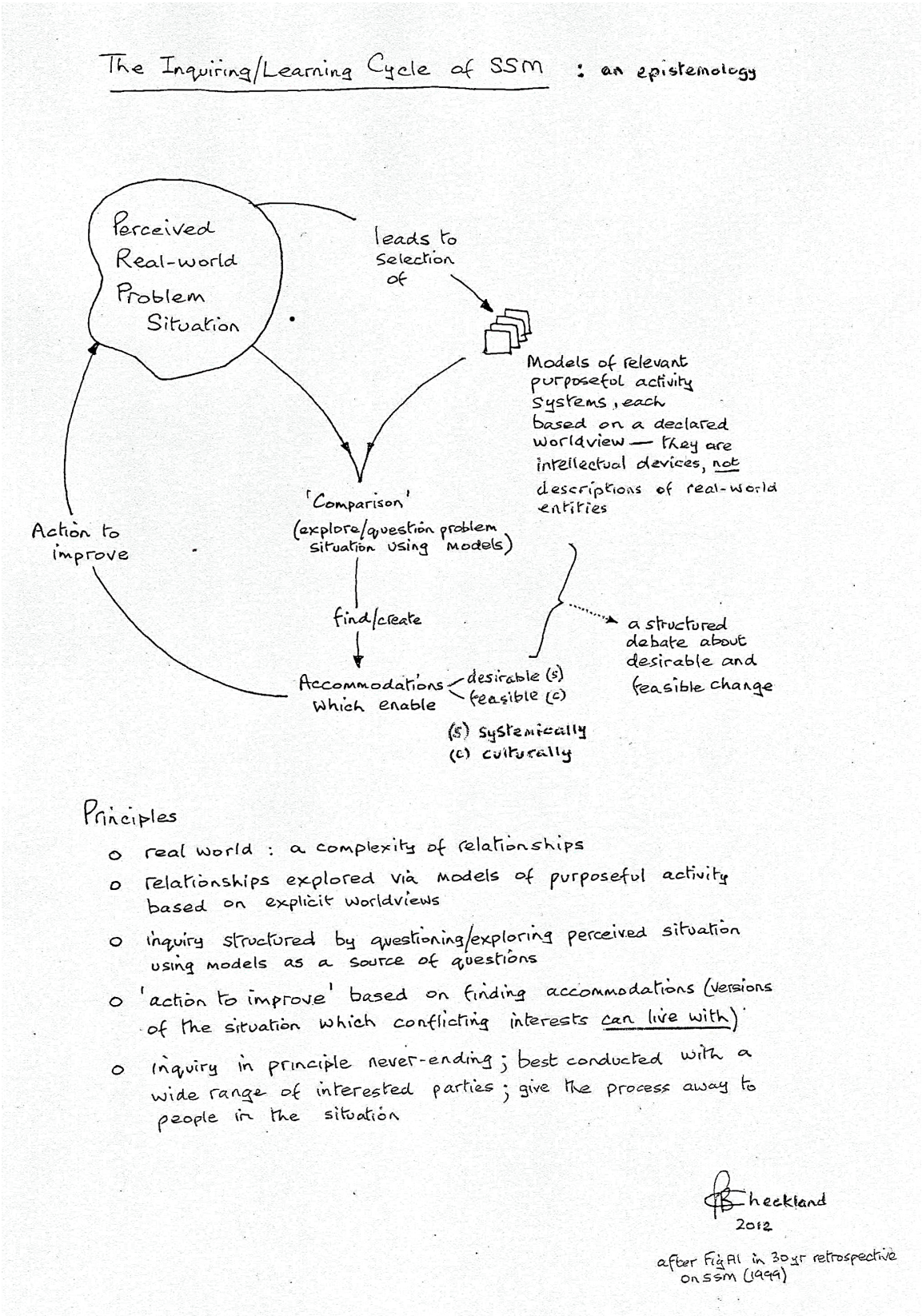

Figure 2: The Inquiring/Learning Cycle of SSM (Checkland, 2012)