

Soft systems methodology

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Introduction

Soft systems methodology (SSM) was developed by Peter Checkland and his colleagues at Lancaster University in the 1970s. It is designed to shape interventions in the problematic situations encountered in management, organisational and policy contexts, where there are often no straightforward 'problems' or easy 'solutions.' Though informed by systems engineering approaches, it breaks with them by recognising the central importance of perspective or world-view in social situations. It differs significantly from the 'systems science' approaches developed in the 1960s, and is more reflective of action research in its philosophy and approach.

Process

SSM is widely described as a seven-stage process, as follows:

1. Identifying the problematic situation that it is desired to intervene in
2. Researching the situation and building a 'rich picture' (interpretive representation) of it
3. Selecting perspectives and building 'root definitions' (key processes that need to take place within the desired system)
4. Developing a conceptual model of the change system
5. Comparing the model with the real-world situation
6. Defining the changes to be implemented
7. Taking action.

This can be applied as a one-off intervention, or it can be treated as an ongoing cycle or action research project, returning to stage 1 or 2 after the intervention has had time to take effect. More recently a four-stage representation of SSM has emerged that incorporates the above stages and adds some further refinements. The description below more-or-less follows that in *Learning for Action*, a recent definitive account of SSM (see 'further reading' below).

Stage 1: finding out

The first part of this stage is concerned with identifying and providing a brief description of the situation it is desired to intervene in. This is normally done by those involved in or affected by the issues coming to a broad agreement about the situation that needs attention. Care should be taken not to formulate the issue as a problem to be solved, as that can lead to too narrow an approach at too early a stage.

The second part involves developing the 'rich picture'. The purpose here is to build up a deep representation of the situation in which intervention is desired. Part of this will involve information about and views on issues that have suggested an intervention, but the 'rich picture' should be much

wider than this and describe the overall situation. A variety of methods can be used to gather information ranging from formal research techniques to unstructured and serendipitous approaches; the advantages of the 'rich picture' is that it draws together information and perspectives from the widest possible range of sources. It is usual to represent the picture visually - often with several alternative depictions - rather than just as text. I like using a mind-map or similar diagram as the final representation, even if it's backed by pages of research.

The third part consists of three analyses of the people-dimension of the situation:

1. Who are the key players in the situation and what worldviews or perspectives do they bring to bear on it? This should identify the 'client' who will cause the intervention/s to happen, the 'practitioner' who will use or guide the SSM process, and the 'owners' of the issues addressed. These may be the same people.
2. What is the cultural environment of the situation? In particular what roles, norms and values help shape the situation?
3. How is the situation affected by politics or power relations? What sources of power are important in the situation? How is power obtained, used, challenged, defended, passed on, given up etc?

These analyses, particularly 2 and 3, are likely to develop further as the project progresses. It's important not to treat them purely as constraints, as anything other than straightforward technical interventions are likely to change aspects of power relations and possibly the culture as well. It's equally important not to work across them as they can act as powerful levers for maintaining or re-establishing the *status quo*.

Stage 2: modelling

This stage is concerned with producing definitions of transformation processes that should achieve the desired intervention(s). The first step is to agree what the change needs to be. This inevitably involves a perspective or perspectives from which it is desirable - which should be stated clearly as it can form an important part of the dialogue in stage 3.

At this point it can be useful to carry out a 'CATWOE' analysis, which will draw in part on the Stage 1 analysis. CATWOE is a mnemonic for:

- Customers (and other stakeholders), i.e. people who are affected by the transformation
- Actors, i.e. the people who perform the activities in the transformation
- Transformation process, stating what is changed and to what
- World-view or perspective from which the transformation is meaningful
- Owner(s), i.e. the person or people who control the transformation
- Environmental / external factors, i.e. anything that constrains the transformation.

Most change projects consist of more than one transforming process, and the above analyses can be applied both at the level of the overall change and (where it differs) for each process. In SSM each process is normally described in the form of a 'root definition' - a short paragraph or long sentence in the format "Do action P (what), using method Q (how), to (help) achieve result R (why)."

Having identified key transformation processes they should then be checked for workability and appropriateness. Checkland *et al* use the 'three Es' criteria:

- Efficiency
- Efficacy (will it produce the desired result?)
- Effectiveness (at an overall level, does it achieve what's needed)?

To this I add Ecology and Ethics. An alternative is fitness for purpose, fitness *of* purpose and systemic wisdom.

The final steps are to put the processes together into an overall conceptual model of the change 'system,' identify any meta-processes needed to manage the overall transition, and develop them into project plans. I normally prefer to start with the overall model and develop individual processes iteratively. I also find that it's usually premature to move into too much detail until after the dialogue stage: it's pragmatically inefficient if changes are needed, and it can also give an impression to colleagues or consultees of a *fait accompli*.

Stage 3: dialogue

Conceptually the dialogue stage involves examining the change model against the real-world situation, usually as represented by the rich picture and associated analyses, and checking that it makes sense. Often the change model needs adjusting, and sometimes the rich picture needs to be developed further.

The other, important function of this stage is to develop a common understanding of the change and the change processes among the key actors and stakeholders involved. The structure from stages 1 and 2 - the rich picture, the 3-part analysis, CATWOE, root definitions, 3 or 5 Es - can be very useful in focussing this dialogue and enabling useful modifications to emerge, provided they are not presented to the uninitiated in SSM-speak.

Checkland *et al* comment that the dialogue phase should be looking for 'accommodation' or broad acceptability, not total consensus which may be impossible to achieve because of participants' differing perspectives. However my experience is that if there are heartfelt issues left unresolved at this stage they will resurface later and may derail or undermine the project, or prevent the change from becoming embedded. The aim should therefore be to out any serious reservations and seek to take account of them; this often involves exploring the assumptions and perspectives behind them, and looking for higher-order solutions that go beyond compromise.

Stage 4: defining and taking action

This stage will vary depending on the specific change project, but essentially it involves developing the (revised) change model into a concrete plan, and taking action to implement it. At this point formal project management protocols may be useful or a less structured approach could be appropriate.

While some change projects may be one-off interventions, it is more usual to think of the SSM process as cyclic in nature. In many projects an intermediate or short cycle is appropriate, where

transition processes are re-examined in the light of early implementation and adjusted as necessary (i.e. returning to stages 2 and 3). This necessarily involves monitoring and investigation, if not always in a formal way, to keep track of the effects of the project: in this sense it is a basic form of action research. When the effects of implementation are becoming apparent it is possible to return to stage 1 and map (and reflect critically on) how the rich picture has changed and whether the overall nature of the situation has changed in any way. In large-scale or open systems as one change takes effect another problematic situation often comes to the fore, pointing to an ongoing set of processes rather than distinct interventions.

Commentary

A potential critique of SSM processes as they have been applied in certain cases is that they become too constrained by organisational and other taken-for-granted structures, leading to solutions that solve immediate problems but leave the situation that gives rise to the problems essentially unchanged. This is likely to happen if the factors revealed by the second and third analyses in stage 1 are interpreted purely as constraints. It can also occur if there is insufficient agreement about the changes needed and the nature of the desired new state. There can also be a tendency, contrary to what Checkland *et al* intended, to use the processes mechanistically as a substitute for intelligent investigation and good judgement.

My perspective on SSM is to regard it as a form of action research. SSM places more emphasis than most action research models on understanding the situation in which intervention is desired and on formulating the action to be taken, while being less explicit about ongoing research, reflection and the overall cyclic nature of the process. Taking this approach allows an overall action research / SSM-based methodology to be adopted that is appropriate for a specific situation, and lets it be adapted as work progresses. In some situations for instance great detail may not be needed for the transformation processes, while attention is needed on data-gathering, evaluation and reflection; in others the opposite may be true.

Finally, and relating back to the first paragraph above, both SSM and action research can be pursued at a problem-solving or issue-based level, or at a more critical level. The critical level looks behind taken-for-granted assumptions and ways of seeing things, and it isn't constrained by conventional ways of organising. To follow a purely critical approach throughout is unlikely to be practicable, but failing to be sufficiently critical at the outset is likely to lead to the kind of problems described above. It's easier to start at a critical level and then drop back into a more pragmatic mode when necessary, rather than starting off with too many assumptions and realising later that the project is becoming too constrained.

Author

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Further reading

- ❖ Checkland, P (1981) *Systems thinking, systems practice* London, John Wiley

The original account of SSM in book form. This isn't a particularly easy read for anyone not familiar with systems engineering and in retrospect it can seem as if it's struggling to emerge from positivistic / technocratic views of systems.

- ❖ Wilson, B (1990) *Systems: concepts, methodologies and applications* Chichester, John Wiley

Until *Learning for action* (below) this was probably the most readable and usable account of SSM, and it's still a useful source of reference.

- ❖ Checkland, P & Poulter, J (2006) *Learning for action: a short definitive account of soft systems methodology* Chichester, John Wiley

This recent addition provides a more up-to-date and clearer exposition of SSM that builds on experience from the last thirty years while also countering some of the misunderstandings that have crept into secondary sources and critiques. Its explanation of the underlying theory is quite brief and it makes little reference to sources beyond the originators, but it does provide one of the clearest expositions of SSM as a methodology.

In addition to the SSM literature, I suggest the following for readers not familiar with the concepts:

- ❖ Ackoff, R L (1974) *Redesigning the Future: a systems approach to societal problems* New York, John Wiley

This discusses the distinction between 'problems' and 'messes' (or problematic situations). An alternative is Rittel & Webber's description of 'wicked problems:'

- ❖ Rittel, H J W & Webber, M (1984) "Planning problems are wicked problems" in N Cross (ed) *Developments in Design Methodology* New York, John Wiley

The original source for action research is:

- ❖ Lewin, K (1946) "Action research and minority problems," *Journal of Social Issues* 2, 34-46

There are many sources for action research as a methodology, including:

- ❖ McNiff, J (1988) *Action research: principles and practices* London, Macmillan
- ❖ Carr, W & Kemmis, S (1986) *Becoming Critical: education, knowledge and action research* Lewes, Falmer Press