

# A Comparison of SSM with an Organisational Learning Model.

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**ABSTRACT:** Checkland has said that the process of doing Soft Systems Methodology (SSM) provides the means by which an organisation can define itself through learning what it is which characterises the organisation. (Checkland and Scholes, 1990, 311-312) If the process of doing SSM is a learning system then in SSM an organisation has a means of instituting organisational learning. Respected authors (specifically Argyris and Schön) in the domains of management and organisational psychology have written on the topic of the Learning Organisation and provided definitions or indicators for such. These include Theory-of-Action, Organisational Ecology and Action Learning Perspective. In order to determine if SSM conforms as a valid means for organisational learning from the perspective of management and psychology, the process of doing SSM is compared with the indicators proposed by Argyris and Schön. The framework for analysing SSM developed by Barnden, Smith and Watson, (1995) is used to structure the comparison. The framework is a capability maturity model for the SSM process.

*Keywords:* SSM, organisational learning, theory-of-action, systems thinking, methodology.

## INTRODUCTION

Soft Systems Methodology (SSM) is described by Checkland and Scholes as a learning system (1990, 277) because it is a self-reflective cycle of purposeful action leading to experiences that inform peoples' knowledge of the domain in which they have taken action (1990, 3-4). Their 1990 text documents cases in which SSM has been applied in studies within organisations where those organisations have ultimately made changes to their structures and processes on the basis of the study results (1990, 59-79, 205-234). The reader of these cases would certainly conclude that the people involved in the SSM-based studies had learned things about their organisation and had made changes to it based on that knowledge. But can this outcome be accurately described as organisational learning? A distinction is made by Argyris and Schön (1996) between individuals within an organisation learning and the organisation as an entity learning.

This paper attempts to identify the elements of a widely accepted theory of organisational learning within the process of doing SSM in order to determine if SSM can be said to be a means for undertaking organisational learning. Argyris and Schön's (1996) Model O-II interpretation of organisational learning is used as the reference form of organisational learning. If Argyris and Schön's indicators of organisational double-loop learning can be identified in SSM's processes then it can be said that using SSM leads to organisational learning.

## SOFT SYSTEMS METHODOLOGY

Soft Systems Methodology was developed over many years in the decade of the 1970s as a methodology for improving ill-structured problematic situations. SSM is perceived to have two versions and the distinction between them is significant in this investigation. The first is as a seven-stage sequence which characteristically has been applied in a cook-book manner to problematic situations (Checkland, 1981), (Davies and Ledington, 1993). Dissatisfied with the mechanistic interpretation of the methodology by many analysts, Checkland and Scholes published a textbook detailing several applications of the methodology. In it they specified what is now called the developed form of SSM which is the second version. It is formulated as two parallel streams of enquiry into the cultural and the logic-based elements of a problematic situation (Checkland and Scholes, 1990). Both of these versions of SSM can be viewed as frameworks for structuring an enquiry into a situation. The principal developer of the methodology, Professor Peter Checkland does not necessarily endorse this mechanistic approach to the methodology as the best way to tackle every problem situation. In his and Scholes' exposition of the developed form of SSM, Checkland explained the process of doing SSM as a continuum. At one extreme of using the methodology is a stage-by-stage application of techniques, the cook book approach. At the other an internalised thinking mode which is used to make sense of the problematic situation which is being investigated. At one end of the continuum the process is a publicly seen set of criteria which prescribe action in the context of an investigation. At the other end it is a personally accepted view of the world which the individual analyst uses to make sense of what they see.

*“The essence of this difference emerged as the difference between, on the one hand, mentally starting from SSM, using it to structure what is done, and, on the other, mentally starting from what is to be done and mapping it onto SSM, or making sense of it through SSM.” (Checkland and Scholes, 281)*

Checkland referred to this distinction in the way in which SSM is used as Mode 1 or Mode 2 use. Mode 1 is the formal stage-by-stage application of the methodology and Mode 2 is the internal mental use of it as a thinking mode. In the context of this study the distinction is useful. Checkland says that the focus of enquiry of Mode 2 use of SSM is “the process of learning one’s way to purposeful improvement of problem situations” (1990, 283). Quite distinctly the developer of the methodology sees it as a way in which an individual learns. However, many applications of the methodology are in Mode 1 and this mode must be considered if the SSM methodology is to be evaluated as a means of organisational learning.

## THE PROCESS OF DOING SSM

The version of SSM which will be analysed in this piece of research is the developed form as described by Checkland and Scholes (1990). Doing SSM is a cyclic activity based on action research and in an interpretive epistemology. The intention of the methodology is to bring about improvement in some area of human concern. A selection of systems thinking methods are used to propose actions that are debated, enacted and reflected upon. The reflection is the basis for deciding whether or not the action was satisfactory and whether or not more cycles are warranted. The methods employed are: definitions of ideal types of certain aspects of the situation; diagrammatic models of the ideal types and; critiques of the models as prospective actions. The actors in an SSM-based study may be an analyst alone or an analyst facilitating a group of actors. Very often the analysts are participants in the problematic situation rather than external “experts”. The term analyst will be used in this report to mean all combinations.

The logic-based stream of enquiry identifies tasks and issues which are relevant in the situation and which lead to proposals of ideal types of systems which might be relevant in an improvement. Simultaneously the cultural enquiry, an enquiry into the social and political realities of the organisational setting takes place in order to modify the proposals of ideal types to take into account “the way things are done around here”. This cultural analysis is composed of three separate studies; Analysis One, Analysis Two and Analysis Three.

Analysis One is an analysis of the intervention itself. That is an analysis of what effect the fact of enquiring into the problematic situation has on that situation. Analysis two is of the social system in terms of interacting roles, norms and values. Analysis Three is of the political system within the situation.

When you are working with somebody looking over your shoulder, observing what you do, asking you to justify your actions, their presence has an influence on what you do and how you do it. When a new member of a work team joins and commences work new relationships are formed, work loads and practices may vary. An analysis team intervening in a problematic situation either as investigators (traditional analysis role) or action researchers will have an impact on the situation no matter how neutral they try to be. Their motivations and methods will have an effect on the people with an interest in the problematic situation. This is the milieu of Analysis One. It identifies the (possibly changing) roles of client, problem solver and problem owner. It investigates their perceptions, wants and motivations in the problem situation.

The social system analysis, Analysis Two, is an investigation of the interactions between all roles in a situation, the norms of behaviour expected of those roles, and the value judgements of the performances of roles according to the standards accepted in that situation. In addition to the three principal roles of Analysis One, the performance of any set of tasks by people will involve many informal roles such as peacemaker, clown, technical guru, moral arbiter and others as needed by the situation. The changing roles, the changing perception of the importance of certain roles, the changing standards which judge good or bad performance in a role will affect the value of logic-based models of action which may be proposed as improvements to the problematic situation.

The analysis of who holds, exercises and delegates authority in the problematic situation is Analysis Three. This analysis attempts to understand what is possible to be achieved. Analysis Three identifies how power is expressed by using Stowell’s (1989) concept of identifying the commodities of power. These are the manifestations of power and the analysis attempts to identify the mechanisms of how they are obtained, expressed, preserved and transmitted. Checkland, writing from a British cultural perspective, cautions that overt display of knowledge of the power structures is itself a powerful weapon. It can turn upon the analysts and bring into play covert or overt exercises of arbitrary power which can destroy the value and purpose of the intervention in the problematic situation. Jackson (1991, 160-166) succinctly presents the various critiques of SSM’s reliance on apolitical consensus in order to be successful.

In undertaking an SSM-based study of a problematic situation, the cultural analysis is constantly informing the definitions and models of proposed action which the logic-based stream of enquiry develops from the observable conditions of the situation.

## **ORGANISATIONAL LEARNING**

Organisational learning is the ability of an organisation, as distinct from an individual within an organisation, to learn. Argyris and Schön (1996) interpret organisational learning as the acquisition of understandings, know-how, techniques and practices of any kind (1996, 3). They say that organisational learning is normative and practice oriented and that it is context dependent. As for SSM, the theory that underlies organisational learning is action research.

We readily accept the notion that the individual can learn. As an organisation is a collection of individuals, so organisational learning could be simply thought of as the aggregated learning of many individuals. Argyris and Schön (1996, 5) transcend this simplistic perception by using the familiar concept of abstraction. From a sufficient distance an organisation can be seen as a monolithic entity. That entity can be treated as an impersonal agent and we see this in such uses of language as “general management selected one of the proposal generated by R&D”. When we treat the organisation as an entity we can ascribe to it the capabilities of an individual.

We know the organisation to be a group of individuals with certain characteristics. They devise agreed upon procedures for making decisions in the name of the organisation. They delegate to individuals the authority to act for the organisation. They set the boundaries between the organisation and the rest of the world. The agreed upon procedures, or rules, may be explicit, tacit or even unconscious, but the actions of members must be governed by those rules. The continuity of those rules, even though membership of the organisation changes, allows us to use the concept of the organisational entity and thus to accept the concept of organisational learning.

The generic schema of organisational learning requires a learning product, a learning process and a learner (Argyris and Schön, 3). The learning product is the informational content which becomes apparent. The learning process is the acquiring, processing and storing of the learning product. The learner is that to whom or to which the learning process is attributed. That is, the individuals constituted as an organisational entity.

The organisation learns when its members learn for it and when that learning is recorded in the environment or culture of the organisation. Learning can be held in the memories of individuals, in files, in the maps and images through which the organisation makes itself known to its members and the world, and in physical artefacts such as mechanisms or tools for doing a complex task. (Argyris and Schön, 1996, 12).

### **Theory of Action**

Theory of Action means that learning is directly shown by an organisation in the strategies which it embodies for the performance of complex tasks (the action) which could be performed in other ways. The strategies may be systems of belief which underlie action, prototypes from which action is derived or as procedural prescriptions for action such as job descriptions, computer programs and manufacturing routings. These are called by Argyris and Schön, Theories of Action and they include the strategies of action, the values which govern the choice of strategies and the assumptions on which the strategies are based.

Organisations have Espoused-Theories and Theories-in-use. The distinction between them being, what they say they do, and what they actually do. Organisational learning is a change to the theory -in-use that becomes embedded in the organisational structures.

### **Single and double loop learning**

Argyris and Schön make the distinction between instrumental learning and learning which changes values. They relate this learning to the concept of first-order and second-order errors. First-order errors in organisational theory-in-use are those practices and outcomes which one recognises as being “not right” or “obvious” errors. Second-order errors are the practices which prevent the causes of first-order errors being questioned.

Instrumental learning, which they call single-loop learning, is that which investigates a situation and changes the theory-in-use to improve the performance of a task within an unchanged value system. It means getting better at doing something. This is good or bad depending on the value system which defines “better”. The other form of learning, which they call double-loop learning, is that which changes the theory-in-use to improve performance as a result of an enquiry into a situation and which questions the norms and values by which that action is judged.

Organisational double-loop learning is related to Bateson’s (1973) concept of deuterolearning, which can be defined as learning how to learn. An organisation will be capable of double-loop learning when the individuals within the organisation become capable of deuterolearning or, double-loop learning.

The clear implication of Argyris and Schön’s research is that double loop learning is good organisational learning and that single loop learning is limited in its usefulness.

## **THEORY OF ACTION AND SSM**

The process of doing a Soft Systems Methodology-based study is taking deliberate action within an organisation. In SSM textbooks we have examples of the espoused theory of action of SSM. Espoused theory is the prescription for theory-in-use during the conduct of any particular study. It will be possible to answer “Yes” to the question “Is the use of Soft Systems Methodology likely to lead to organisational learning?” if the indicators of organisational double-loop learning can be identified in SSM’s processes.

### **Using SSM**

The process of doing SSM is defined by Checkland and Scholes (1990, 284-297) in a collection of statements, definitions and diagrams. It has been re-interpreted as a tabular capability maturity framework by Barnden, Smith and Watson (1995). The framework represents the philosophy, the process, and the techniques and epistemology of SSM. The 36 elements of SSM extracted (without the maturity indicators) from the framework are shown as Appendix 1.

The philosophy of SSM is the five Constitutive Rules of Checkland and Scholes (1990, 286-287) which are an attempt to account for the family resemblances which characterise the spectrum of SSM. These emphasise:

- the objective of improving a problematic real world situation
- the approach of structured thinking based on systems ideas
- the boundaries of the study wherein there is no automatic assumption that the real world is systemic and a distinction between the real world and systems thinking about the real world
- conscious thinking about how to adapt the methodology to the particular situation
- the reflection on what methodological lessons can be learnt from the experience of using SSM.

The process of SSM is the mapping of the sixteen human activity systems conceptual model of the system to do SSM onto the actual experience of the study. Figure 10-8 in Checkland and Scholes (1990) defines this conceptual model.

The techniques and concepts to be applied include the concepts of the real world and the systems thinking world, of the problematic situation, of desirable and feasible change and of taking action. The techniques include rich picture diagrams, analyses one, two and three, root definitions, CATWOE, the five Es, conceptual modelling, and model comparison.

### **Evaluating SSM for Organisational Learning**

The generic schema for organisational learning requires a learning product. This is the informational content which becomes apparent in the course of the study. It is represented in the SSM framework by several elements. Specification of the desirable and feasible change that results from comparison of proposed ideal types of systems (holons) with the real world situation represents learning product. What has been learned from the study is implemented as change within the organisation.

The generic schema also requires a learning process of acquiring, processing and storing the learning product. From the perspective of a systems analyst, these are activities which occur in every analytical study. We see them in the framework description of SSM in several elements. The learning product does not spring fully formed from the brow of the analyst during the study but is built up from components of learning which are acquired then processed into the learning product. The process of doing SSM acquires information in the forms of the appreciation of the problematic situation; rich picture diagrams; the building of analyses one, two and three; and in the appreciation of former uses of SSM in similar circumstances.

The processing of acquired information occurs by constructing root definitions; constructing the elements of the CATWOE mnemonic; by constructing conceptual models of ideal types; in the comparison of conceptual models of changes with the real world situation and the criteria for efficacy, efficiency, effectiveness, ethicality and elegance.

Storing of the learning product is seen principally in the specification of desirable and feasible action, but also in the conceptual models and the rich picture diagrams. Argyris and Schön describe the storage of learning product in terms of “memories of individuals, in files, in the maps and images through which the organisation makes itself known to its members and the world”. The nature of a generally applicable analysis methodology like SSM is not to prescribe the mechanism of storage but to present the results. Whether or not corporate documentation is changed to reflect the new theory-in-use which results from the study cannot be prescribed. However, a characteristic of SSM in this area is that it is usually undertaken by participants in the problematic situation. The learning product will at least be in their memory and practice if not in the maps and images of the company.

Until the theory-in-use of the organisation has changed, it cannot be said that organisational learning has occurred. The action research basis of the process of doing SSM requires that theory-in-use changes. Taking desirable and feasible action in the problematic situation is part of the process of doing SSM. Reflection on the action (the theory-in-use) is also part of doing SSM. Acquisition of the learning product in SSM also comes from reflection by the analyst on the actions taken as feasible and desirable change in order to improve the problematic situation.

The elements of SSM which take it beyond instrumental learning to double-loop learning are these. The first constitutive rule of SSM is that it is used to improve some problematic situation in the real world. This intent characterises both single and double-loop learning. But the third constitutive rule that there is no automatic assumption that the real world is systemic takes SSM beyond the cause and effect determinism of single-loop learning by requiring a questioning of the analyst (learner) of the bases for outcomes. The requirement that actions be for feasible change as well as desirable change requires the analyst to consider the cultural environment of the problematic situation. The belief systems of the culture including the values used to judge action outcomes require the analyst to question the basis for proposed action. It is necessary to decide whether or not value systems and norms of behaviour in the situation need to be accommodated, modified or justified when taking action. This examination of values is a characteristic of double-loop learning.

SSM also requires of its analysts to consciously think of any adaptations to the methodology that may be required in adapting to a particular study situation. This is stated in the fourth constitutive rule of SSM. In adapting the methodology to a situation, the use of such an adaptation must be reflected upon for its possible beneficial use as a new component of the SSM methodology. The fifth constitutive rule of the methodology makes this requirement. An element of the process of doing SSM is to capture the learning for future use.

This conscious thought about particular applications of SSM and the reflection on the possibility for methodological benefits of such adaptations can be seen as a questioning of the assumptions about the “normal” process of doing SSM. The requirement to capture (store) the learning for future use and the process of doing SSM itself fits the definition of double-loop learning proposed by Argyris and Schön.

## CONCLUSION

From this conceptual study of Soft Systems Methodology and Argyris and Schön’s Model O-II of Organisational Learning it can be concluded that the process of doing SSM as defined in its standard form enables organisational learning to occur within the problematic situations in which SSM is used as the methodology of study. It can also be concluded that SSM in its developed form is a learning system that conforms to the definition of double-loop learning.

In order for this conclusion to be verified an analysis of the process of doing SSM in a real life problematic situation can be undertaken and the indicators described above sought and documented.

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## APPENDIX 1

### Elements of SSM from the Capability Maturity Framework

*Philosophy:*

Constitutive Rules

1. Improvement in some problematic real world situation
2. Structured thinking based on systems ideas
- 3.a No automatic assumption that the world is systemic
- 3.b A distinction between the real world and systems thinking about the real world
- 3.c Systems thinking involving the construction of holons
- 3.d Desirable and feasible change defined by comparison of holons with the real world
4. Any potential use should be characterised by conscious thought about how to adapt it to a particular situation
5. Methodological lessons can be extracted by conscious reflection on the experience of using SSM

*Process:*

Decide issues concerning mounting and doing the study

Do Analysis One

Build up pictures of the problematic situation

Select relevant systems in the form of root definitions and CATWOE

Build conceptual models

Compare models with perceived reality and look for possible changes

Decide what are desirable and feasible changes

Take action

Build up Analysis Two and Analysis Three

Define criteria for efficacy, efficiency, effectiveness, ethicality and elegance of the 9 activities above

Monitor the 9 activities above

Take control action

Appreciate this and previous uses of SSM

Reflect upon the learning from this use of SSM

Appreciate the current view of the use of SSM

Capture learning for future use

*Techniques:*

Recognise the real world

Distinguish the systems thinking world

Characterise the problem situation

Analyses One, Two and Three

Rich Pictures (characteristically Rich Picture Diagrams)

Root Definitions

CATWOE

The five Es (efficiency, efficacy, effectiveness, ethicality, elegance)

Conceptual modelling

Comparison

Desirable and feasible change

Action