

Link 4.1 Description of the Stages of Wilson's (1990) Soft Systems Method

Overview of Wilson's Method

Wilson (1990) soft systems method comprises eight stages shown in Table 4.1. Some of the stages involve activities that involve modeling aspects of the real world. Other activities require a separation from the real world; stepping back from the problem, constraints and structures of the real world in order to explore concepts more freely. The first four stages are iterative; they explore different views about the problem situation and seek to develop a consensus model of activities that will effectively address the situation identified. It is important to note here that the soft systems method starts with a situation which is considered to be problematic. The method then seeks to explore the situation to uncover the issues that are causing concern. In contrast, hard systems approaches start with a defined problem which is assumed to be agreed, and then seeks to design a solution to solve the problems. Soft systems approaches do not seek to solve problems; they seek to develop understanding of problematic situations.

Table 4.1: Stages in Wilson's Soft Systems Method (based on Wilson, 1990, 2001)

Real World	Thinking About the Real World
1. Find out about Situation and Express the Situation.	
	2. Formulate Potential Root Definitions.
	3. Develop Conceptual Models.
4. Compare Conceptual Models with Real World and Develop Consensus Model.	
	5. Derive Information Categories.
	6. Map Activity to Activity Information Flows.
7. Map Current Information Provision.	
8. Map Organization Structure.	

Table 4.2 defines the soft systems modeling tools used in the following stages.

Table 4.2: Soft Systems Tools

Tools	Definition
Rich Picture	A diagrammatic representation of different views within a problem situation, using free-form notation.
Root Definition	A textual description of the activity system that represents one view of the world shown in the rich picture.
CATWOE	Six elements that provide the foundation of a root definition.
Conceptual Model	A diagrammatic representation of the activities, and the relationships between activities, required to satisfy the transformation process identified in the root definition.
Consensus Model	A conceptual model of activities which encompasses a shared view of the world, agreed to by those involved in the problem situation.
Information Categories	The groups of data that are needed as input to, output from, or to monitor activities within the system represented by the consensus conceptual model.
Maltese Cross	<p>A matrix mapping the information categories input to and output from:</p> <p>A) Activities included in the consensus conceptual model. B) Equivalent existing information processes in the real world.</p> <p>It enables the completeness of the information requirements needed to support activities in the consensus model to be verified and then compared with the existing implemented systems.</p>

Stage 1 Find out about Situation and Express the Situation

The first stage, finding out about the situation, involves the formation of a rich picture about the situation. This is common to both Wilson (1990) and Checkland's (1981) soft systems method. The term rich picture was originally intended to refer to gaining an understanding of the problem situation, however, in many applications of the methods it has been interpreted as preparing a physical diagram. A key feature of a rich picture as a diagram is that unlike the models discussed earlier, it does not consist of a predefined set of concepts that provide the lens through which the situation is modeled. A rich picture does not have a defined set of notation; it is a freeform diagram intended to capture the rich complexity of the problem situation. This includes areas of conflict, cultural values and pressures in the situation. Wilson (2001) provides a list of common symbols that have evolved in rich pictures such as the use a pair of crossed swords to indicate conflict or competition within the situation. However, a strength of the rich picture is the flexibility to create new symbols, providing the freedom to represent the specific features of the unique situation under consideration.

Stage 2 Formulate Potential Root Definitions

When a rich picture of the situation has been attained, the real world is temporarily set aside to enable different views expressed in the situation to be explored in detail. Each view of the situation is considered separately. The aim of this stage is to create a root definition which captures the essence of the view of the situation held by different people in the situation. A root definition describes the aim of the human activity system that encapsulates a particular view of the world (Patching, 1990). A root definition is a textual description of one view of the world encapsulated in one sentence. It provides the description of the perceived system which can then be modelled. A root definition combines two main elements: a world view and an associated transformation process. It is formed using CATWOE, a tool consisting of six elements which provides the constructs for defining the system needed to satisfy one view of the world. CATWOE is the key tool in soft systems methodology which determines the quality of the subsequent system modelled (Basden & Wood-Harper, 2006).

CATWOE represents:

- Customer: The individuals or groups of people who will be affected either positively or negatively by the outputs of the system. It is important to note that the word *customer* is not used here to refer to someone who buys goods and services from an organization. Although in some situations customers of an organization may also be identified as beneficiaries of the system, a broader view of beneficiaries is adopted in CATWOE.
- Actor: The individuals or groups of people who undertake the activities needed to complete the transformation process of the system.
- Transformation Process: This is main conversion of inputs to outputs required by the system.
- Weltanschauung: The specific view of the world, identified from the rich picture, which incorporates the assumptions on which the system is to be based.
- Owner: The individuals or groups of people who have the power to create or remove the system.
- Environment: Factors external to the system, over which it has not control, that affect and constrain how the transformation process can be performed.

After completing the elements of CATWOE, the elements can be incorporated to form the root definition of the ideal system, which supports the view of the world selected. Different CATWOEs and root definitions are formed for each view represented in the rich picture.

Stage 3 Develop Conceptual Models

The root definition outlines the aim of the ideal system that represents the underlying assumptions of one view of the world expressed in the rich picture. In stage 3, the activities needed to perform the transformation process stated in the root definition are identified. A conceptual model is created that identifies the main activities, and the relationships between them, that are needed for the system to:

- Complete the identified transformation process.
- Be performed by the identified actors.
- Create outputs that impact the identified customers.
- Report performance to the identified owner.
- Operate within the defined external constraints.
- Satisfies the view of the world modelled.

It is important to note that the term *conceptual model* is used here to refer to activities, in contrast to the term *conceptual data model* which refers to data.

In addition to the activities directly needed to satisfy the root definition's transformation process, the conceptual model also needs to include activities to monitor and control the performance of the system, reporting back to the system's owners. This includes activities to measure:

- Efficacy: does the system achieve the required transformation process?
- Efficiency: does the system use the minimum resources required to achieve the performance and quality of outputs required?
- Effectiveness: does the system achieve the underlying objectives reflected in the world view?

Stage 4 Compare Conceptual Models with Real World and Develop Consensus Model

A conceptual model is created in stage 3 for each root definition. These are the ideal systems which satisfy the world views identified from the rich picture. It is impractical to physically implement several often conflicting systems. In stage 4, the conceptual models are compared with the current activities being performed back in the real world. The models form a basis for discussion with the aim of developing a consensus conceptual model. A strength of the model is that it allows activities to be explored independently of the current (or future) organizational structure (Wilson, 2001). It is created through an interactive process of combining individual conceptual models, deriving an agreed root definition, refining the consensus conceptual model and gaining support for it.

Stage 5 Derive Information Categories

The consensus conceptual model identifies the activities required by the system to improve the problem situation, which is agreed by those within the situation. In this stage, the data that is input to each activity, output from each activity and needed to measure the performance of each activity in the consensus conceptual model is identified. A list of information categories can then be defined. Wilson (1990) explains that the boundary of an information category can be defined by the data that it includes. This represents an infological approach to modelling.

Stage 6 Map Activity to Activity Information Flows

The data required by the individual activities within the consensus model has been identified in stage 5. Some of the information categories identified in stage 5 may be used by more than one activity in the model. In stage 6, information categories are mapped to the activities in the consensus conceptual model in which they are used. This forms the top half of the model referred to as the Maltese Cross. The Maltese Cross is used to determine whether all the information categories needed by the consensus conceptual model have been identified. It also supports analysis of where information categories are created. For example, if an information category is used as input to an activity, but the information category is not created by an activity in the model, further consideration needs to be given to the external source of the information category.

Stage 7 Map Current Information Provision

The bottom half of the Maltese Cross is created in stage 7 and represents a datalogical approach to modelling. The existing processes in the real world, where they exist, which correspond to the conceptual activities identified in the consensus conceptual model are listed in the bottom of the cross. A mapping is then completed to indicate which information categories are created or used by existing processes in the real world. The Maltese Cross is used to support discussion about potential changes needed to existing information systems and information provision in the organization.

Stage 8 Map Organization Structure

The consensus conceptual model and the mapping of activities to information categories is compared with the existing organizational structure. This supports discussion about where activities take place in the organization and the flow of information between the activities that may cross departmental and functional boundaries.

References

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