

ABSTRACT.

This paper is an account of the checkland's soft system methodology. The methodology has been designed to tackle organizational problems holistically, but found very useful in building theoretical model and practical use in «real-World» problems. It is therefore a systems-based methodology which uses systems ideas to find a structure in apparently ill-structured soft-problem situations. Hence, provides a set of activities which together comprise an inquiring system and an appreciative system.

The methodology outlined below has emerged tentatively through an action research program of client-sponsored systems studies during the period 1961-1971 in the department of systems engineering as a part of a postgraduate program. The methodology now underway for about two decades was established progressively from a body of practical experience on the «real-world» and the proposition that the development of systems ideas and thinking can help in understanding the world and in trying to resolve its problems (Mingers, 1980).

The starting point of the research was the application of hard systems engineering principles and ideas to unsuitable soft problem situations. Causes and implications of the failure have been worked out from a number of studies and generalized into an efficient model of soft systems approach and guidelines for deriving criteria for effectiveness based on the model (Brember, 1985).

Checklands' soft systems approach is therefore a systems-based methodology which uses systems ideas to find a structure in apparently ill-structured soft-problem situations and hence provides a set of activities which together comprise an inquiring system and an appreciative system to the useful description of the context of problems in the real-world (Checkland, 1972, p.92; Checkland, 1981, p.7).

The methodology appeals to the principles of the Kantian/Hegelian dialectic to formulate competing W's or systems models structured on opposed root definition of concerned actors to operationalise the consensus of concerned actors. And above all the acceptance of the Singerian concept that a soft systems study is

THE CHECKLAND SOFT SYSTEMS METHODOLOGY

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never complete (Mingers, 1980, p.46; Checkland, 1981, p.8). The crucial characteristic of the Checkland's methodology is the concept of a human activity system (H.A.S), the «real-world» manifestations of the concept consist of a group of human beings gathered together to perform purposeful activity and it is within such systems that objectives and measures of performance originate (Mingers, 1980, p.44).

Human factor is explicitly taken into consideration into the analysis as forming the essential part of the system under investigation, as Eric J. Miller, 1976, p.84 pointed out :

«Organization have no structure apart from the patterns of behaviour that are also their internal functions, those patterns of behaviour stop. The organization ceases to exist, and buildings and equipments do not reveal the nature of the organization in the real life».

Human activity system is represented in the form of the point of view of the observer, as customers or beneficiaries of the system, and as owners of the system who have power to cause the system to cease to exist. Those human beings evidently will possess a range of perceptions both of the system as a whole and their role within it.

These differing and conflicting perceptions are all meaningful according to the particular actors' weltanschauung (W) or world-view. It is a very important concept in Checklands' work; concept which embodies the notion that Human beings have specific and significantly different and yet valid ways of noticing particular aspects of a situation, discriminating them in particular ways and measuring them against particular standard of comparison built up from individual ways of experiencing the world in terms of purposes, knowledge, values, expectations and even education (Checkland, 1972; Mingers, 1980).

Discrepancies between those multiple and conflicting W's are almost inevitable but also constructive in the sense that the methodology which is described below, faces explicitly this problem by exposing and counter-posing the W's in order to reach a feasible and desirable compromise concerning possible changes or improvements based on an objective appreciation by the actors involved of their own and other's values and beliefs (Miller, 1976, p.44; Mingers, 1980).

The most important point is that the methodology allows a completely equal participation of the concerned actors in terms of power, information and opportunities in the discussion and all are taken into account during the analysis phase. The solution obviously will not be stable, because of the change both outside and inside the organization to the extent that conflict and compromise-values are never-ending (Miller, 1976).

The methodology as reported by (Brember, 1985, p.62) :

«...should act as an aid to clear thinking. It is designed to deal with problems that are not easily defined in exact terms, and does not give exact answers. However, it does give a clear understanding of the system under study and assists manager in developing their answers».

The crux of the methodology resides in the Root definition and conceptualisation of relevant systems. A number of research studies in subsequent project have permitted to express the methodology in clear terms and reveal some of its implications. It has departed from «hard systems» approach :

- 1.-Firstly in a more open-ended analysis phase, not carried out in system terms.
- 2.- Secondly in introducing the Root Definition of relevant systems which will serve as inputs in the construction of the conceptual model and;
- 3.- finally being faced to abandon the idea of designing a system except in special occasions of either a well-structured problem with specifiable and predictable objectives or in a green-fied situation in which conceptualisation precedes the design activity. A phase concerned with defining the «what» before design itself gets to define the «How». (Checkland, 1972, p.93).

This because the traditional concept of systems engineering and systems analysis remains tied up to the sphere of technical rationality from which it

derived and focusses the attention on physical systems in which the role of living matter is neglected if not discarded. In short, it fails to recognize the dynamic character of its subjects-purposeful, self-defining, reflexive human beings and the content within which the creation and agreement of objectives and values take place (Mingers, 1980, p.44).

In other words, it is a flexible set of connected logical activities and moves from finding out about the problem situation in the «real-world» to taking action within it, and does so via system thinking about the «real-world» (Checkland, 1980 p. 51). Flexible and interactive in the sense that the barriers between the prescribed sequence are very flexible allowing to start anywhere and to move in any direction. It is frequently the case that some activities in the development stages overlap and it is during backward and forward information flows that contradictions, conflicts, omissions are pointed out and worked out. The iteration process on the other hand constitutes the first step towards a well-formulated model of the system under study.

A number of research studies in the subject posited that we are concerned with problems which occur in Human Activity systems and it is reasonably useful to view the universe as a complex of interacting systems and that the methodology should be flexible and iterative in order to accommodate the various but conflicting problem-solving styles of different personality types. The overall set of activities as shown in fig.1 enables whatever is being done at any moment in time to be related to the inquiring system as a whole. Because no «solutions» in Human Activity Systems are permanent and «problem-solving» is seen to be an on-going process rather than an engineering process in which a specific objective defined as desirable is achieved. The methodology which embodies a system approach to «soft» «ill-structured» problems involves the following steps :

- 1.- **Problem situation** (expressed but not defined).
- 2.- **Analysis** (non-systemic analysis of what exists at present in the problem-situation).
- 3.- **Root Definition of relevant systems** (based on the real-world of actual occurrences).
- 4.- **Conceptualisation** (of systems to fulfil the roles embodied in 3).
- 5.- **Comparison** (between 2 and 4).
- 6.- **Definition** (of a range of possible changes).
- 7.- **Design** (of a desired, agreed to be feasible change).

The methodology makes a sharp discrimination between activity in the real-world, involving real-world actors (see fig.1, activities 1, 2, 5, 6, 7) and systems thinking (conceptual constructs) about the real-world problems (activities 3, 4, 4a, 4b). Systems thinking activity comprises the following steps :

- 1.- Based on the analysis phase, the activity is concerned in selecting and identifying some relevant Human Activity Systems and their corresponding W's; which the investigator in the role of a problem-solver has selected as likely to provide insight and improvement to what is perceived as a problem situation.
- 2.- Defining and formulating a concise but precise description of these systems and their corresponding view points in Root Definition which should contain the following elements for which the mnemonic «CATWOE» has been established (Checkland, 1979).

The CATWOE which has emerged from a historical analysis of definitions used in actual studies and is made up of the following elements (Checkland, 1976) :

C = Customers, clients, users or beneficiaries of the system actions if it were to exist in the real-world.

A = Actors or agents who are involved in conducting, monitoring and controlling the process or activities of the considered system if it were to exist.

T = Stands for «Transformation» the core of the Root Definition, which is the fundamental input/output transformation process carried out in and by the national system.

W = Stands for «Weltanschauung» the often for granted image of the world which makes this particular system a meaningful one to consider.

O = Owners refers to the ownership of the system, in the sense that they would have the power to create, alter or abolish the system.

E = Stands for environmental constraints, the unalterable environmental impositions of the system.

- 3.- The next step consists of developing models for each of the Root Definition in terms of the minimum and necessary activities required in an H.A.S to be the system named in the Root

Definition. The purpose is to create objectively in the light of the problem situation an ideal model which can be compared, formally and specifically with the picture built up in the analysis phase. The concern is to include every activity implied by the definition but no extra ones while at the same time being not unaware or the reality. The overall operation is aimed to bridge the gap between the conceptual model and the problem situation.

- 4.- Then comes the validation phase, validating process in «soft» systems methodology does not imply the same activity as in «Hard» systems techniques, that is to demonstrate that the design meets all the established requirements and/or the verification that the design correctly implements the intention of the designer.

In «soft» systems approach the process consists of assessing the validity of the conceptual models alongside with any other systems thinking or any systems theory relevant to Human Activity Systems; for example inspected against the Tavistock socio-technical system model, or extended to incorporate Beers' model or to make sure that the model is compatible with Beers'. Because the methodology was developed at the level of principles of method, rather than as a technique, it is essential that it should not in principle exclude any systems thinking being developed elsewhere (Checkland, 1981).

Therefore the validating process concern the action of checking the conceptual model against a general model «formal system» of any purposeful H.A.S or to other system thinking.

The aim according to Checkland, (1972, p.102) is at least to ensure that it is not basically deficient. When several W's with their related Root Definition have been investigated and the corresponding conceptual models have been built; «real-world» activity follows in which a comparison of these models with the initial description of what actually exists. The purpose of this comparison stage (5) is to generate and structure a debate about norms, values and the standards by which they are evaluated.

The outcome of this action is to specify desirable and feasible changes given prevailing attitudes and power structures; gain agreement on the implementation of changes (consensus-values) or a lack of agreement imputed to a bad definition of the

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