Tadeja Jere Lazanski

1) University of Primorska, Slovenia
tadeja.lazanski@upr.si

SYSTEMS THINKING = THINKING OUT OF THE BOX = REACHING QUALITY OF LIFE

Abstract: *Systems approach is introduced by methods of systems thinking, causal loop diagram (CLD) and ABCDE model. We claim that systems thinking as (w)holistic thinking , taking into consideration wholes and not only elements, brings broader understanding of society and people's interrelations and responds.*

Keywords: *Systems Thinking, Analytical Thinking, Modeling, ABCDE model, CLD diagram*

1. INTRODUCTION

Contemporary systems thinking has been used as a method of systems approach from early nineties of previous century.
This paper will present the process of the growth systems thinking awareness, which represents the shift of consciousness, its benefits and its deficits.

2. PROBLEM STATEMENT

2.1 Basic assumptions

Analytical thinking has been a dominant mode in science and everydays life for centuries. Analysis plays an important role in human consciousness since from his childhood, a man is taught to break apart problems in order to make complex tasks and subjects easier to deal with.This creates a problem, since a man loses the ability to see the consequences of his actions, and he loses a sense of connection to a larger whole. Systems thinking shows that there is no separate "other";that we and the someone else are part of a single system [1]. People and institutions around the world still falls into the trap of analytical thinking, which is short-term thinking without feedback information and knowing the deeper meaning of a challenge. Quality of thinking and consequently living, bases on duality and separation. This leads to a fact that reductionism in science and real life can never bring ful understanding of the world, not in the way reductionistic science has led us to expect. To resolve this problem and consequently rise up quality of living, we need reorientation in thinking and systems understanding. Systems may exhibit adaptive, dynamic, goal-seeking and sometimes evolutionary behaviour [2]. With methods of systems approach we will present systems models: ABCDE diagram of systems thinking and causal loop diagram of quality of life.

3. SYSTEM THINKING

3.1 Explanation and Understanding

One of the definitions [3] of systems thinking says that system thinking emphasizes looking at wholes rather than parts, and stresses the role of interconnections. It is a circular and focuses on closed interdependencies, where e.g. Observer 1 influences Observer 2, Observer 2 influences Observer 3, and Observer 3 influences Observer 1. It opens a window on our mental models,

translating our individual perceptions into explicit pictures that can reveal subtle yet meaningful differences in viewpoints. System thinking shows a big picture perspective, one of wholeness, which is connected to patterns and finally to the structure [4]. Patterns are trends, or changes in events over time. Whenever one sees a pattern of events, one comes closer to grasping the systemic structure driving that pattern. Structure always gives answers to the questions why a pattern is happening or what is causing an event. Thinking at the structural level means thinking in terms of feedback connections. Systems thinking means understanding the patterns and structure that lie below the surface of the "iceberg". It is importnat to avoid the "iceberg trap", i.e. short sighted and conventional solutions, when searching for the high quality answers, solutions or creating new culture.

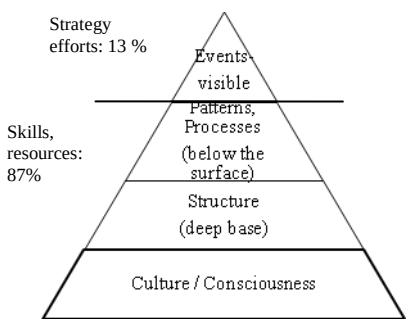

Fig. 1: Iceberg as a short-sighted trap [5]

As shown in Figure 1 the trap of short-sightedness is the decision maker's failure to concentrate on the 2nd and 3rd, levels of Processes and Structures. What "sinks" the strategy effort is the same that sinks ships: the invisible part below the surface. Following Haines [5], in an iceberg, 87% of it is below the waterline. Quality strategy makers should consider the two levels below the surface as those that can sink strategy efforts. An optimal strategy, which causes a change for the better, depends on good processes and structures. This way the change of the societal culture and consciousness follows. To foresee and see what in fact is under the "sea level" enables us to create optimal decisions. In systems language we can name this skill" thinking out of the box or the big picture". Long term and quality decisions require systems thinking, which bases on scenarios and modelling.

	Action Mode	Time Orientation	Way of Perceiving
Events	React!	Present	Witness event
Patterns	Adapt!	↓	Track patterns of events
Structure	Create change!	Future	models and other ST tools

Fig. 2: Levels of Understanding [3]

Figure 2 shows the richness of the three levels of understanding: reaction to an event, adaptation of patterns and creating change going to the structure. The real power of (systems) structural-level thinking comes in the fact that actions taken at the level of event are creative; because they help the observer to shape a different future, the future that he wants [6]. His ability to influence the future process increases as he moves from event-level to pattern-level and to structural-level thinking. The art of thinking at the systemic structure level comes with knowing when to address a problem at the event, pattern or structural level, and when to use an approach that combines the three [3].

3.2 Modeling

Modeling represents the activity to describe our experiences by using one of the existing languages in the framework of a certain theory. In this way, our experiences also become accessible to others: they may be proven, confirmed,

rejected, broadened or generalized. This paradigm can be stated [7] with a triplet (O, S, M). O represents the real object, original, independent from the observer, while S represents the researcher (subject) or an observer with his knowledge, and M the model of the object. Their relations in the process of analyzing are shown in Figure 3.

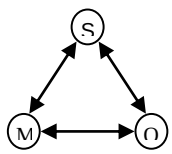

Fig. 3: Observer in the modelling process.

From Figure 3, a "naive realist" supposes that: 1. an external world exists independently of the observer, 2. this world isn't directly observable and 3. For its representation, we set up simplified models. The relation between the observer S and the object O - is of essential significance in the cognitive method. The observer is a person, with all his cognitive qualities, while the object of research is the manifested world, which exists by itself, regardless of how it can be described. In this case, the object and the system have the same meaning. The third article of the triad M is the consecutive one and represents a model or a picture of the analysed system O. The $O \leftrightarrow S$ relation in Figure 3 indicates the reflection of human experiences to concrete reality. This cognitive consciousness represents our mental model. The relationship $M \leftrightarrow S$ represents the problem of knowledge presentation, respectively the translation of the mental model into the actual model. The $O \leftrightarrow M$ relation represents the phase of model validation or proof of correspondence between theory and practice, which render possible the generalization of experiences into rules and laws. The $S \rightarrow O \rightarrow M$ relationship is nothing else but an active relation of the subject in the phase of the object's cognition. The $M \rightarrow O \rightarrow S$ relation is nothing more than the process of learning and generalization. A theory is an intellectual construct enabling us to give a more generalized form about the phenomena of the research to the directly obtained results from the experiment. In the cognitive process, the value standpoints of subject S_v are far more important to us in relation to the object of research in the modelling process. This can be stated in the following equations:

$$S_v \cap (O \cap M) = 0 \qquad (1)$$

$$S_v \cap (O \cap M) \neq 0 \qquad (2).$$

In the second part of the equation (1) and (2) $O \cap M \leq 1$ are always fulfilled. In the case of $O \cap M = 1$, the model and original are identical. The expression (1) is valid for formal and natural sciences, where $S_v = \varnothing$ (empty set). This means that it is impossible to find any link between the axiom and the hypothesis linked to model M and value standpoints of the subject [8]. That is, of course, not valid for the scientific hypothesis in the process of modelling, this is always the product of the intellect and historically conditioned by the progress of science: these hypotheses are always rejectable [9]. In the case of organizational sciences and humanities in equation (2) the value standpoints of the researcher and the object of the research are always $S_v \neq \varnothing$. Some qualities are always added to the description of the observer in question which are not provable. The conditions expressed by (1) and (2) have a key meaning in the choice of research methodology and for the scientific value of the statement. The first expression renders possible the establishing of the principle testable hypothesis by means of active experiments of the subject, while the second cannot and is not allowed to prove the hypothesis through experiment, but by observation and generalization dependent on

the qualities of the observer. The answer lies in the problem itself, which needs to be solved and in what one understood with system dynamics or thinking methodology.

4. THE "ABCDE" MODEL AND CLD DIAGRAM

Creating A model is much like solving a brain teaser [10].

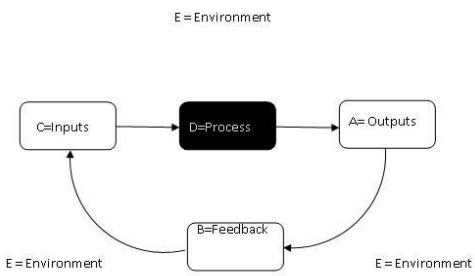

Fig. 4: Systems thining model

A step from analytical thinking to systems thinking is visible, since the observer uses as his primary questions the questions about the influence of his vision or (A-outputs) to the environment (E-other people, nature, society), uses feedback information (B-what will my vision bring to the E) and asks himself what will my vision (A-outputs) bring to the environment (E) and what is the current situation (C-inputs, ideas, teams, co-creation) for achieving the (A) and how can I help in the process (B), either with help or without any worries if he cannot influence the process. The essential differences between the systems and analytical diagrams lie in the beginning of observer's thinking; the analytical observer starts to think from left to the right and this thinking leads him in a linear direction to the outputs, regardless of the consideration of environment or the questions of what the outputs bring or what the observer wants to achieve. The observer with systems consciousness starts to think at the right side, anticipating the outputs, their impact on the environment and their feedback for the present situation and inputs as well as the process. The complementarity of both types of thinking lies in the fact that analytical thinking mostly concerns visible events and consequently short-term solutions; systems thinking considers both: short- and long-term solutions, which as a necessity uses the results of the analysis and analytical thinking [6].

Fig. 5 represents a causal-loop diagram (CLD) of a society model, which is the basis of a simulation model [8]. The directed branch represents the flow between entities. In other words, Fig. 5 represents the directed graph of the societal system anticipated in a society strategy.

Fig. 5: CLD of quality of life

The diagram shows society strategy, which scenarios and ideas influence quality of life (+), quality of life influences positively upon quality products(+), quality products influences area quality (+). At the same time they have positive influences (+) on wellness and spa offer, which influence area quality (+) and the number of people, who visit the destination (+). Destination and marketing (+) influence society strategy ideas and scenarios (+). Culture and events influence (+) wellness and spa offer, which makes the area more attractive, quality, is higher

(+). High quality area influences the number of people (+) on the destination (+), the number of people influences the attraction quality (-). Quality of life influences environment preservation, (-), which influences area attractiveness (-). Positive causal loop circles mean growth, yet it must be said that every aggravation follows a decline in growth. Qualitative (CLD) model is usually followed by quantitative (SD) model.

5. CONCLUSIONS

In this paper we presented systems thinking, the iceberg trap of analytical thinking and two systems models, which explain interconnectedntess of systems elements and their influences upon each other. Qualitative CLD model is usually followed by quantitative SD model. In this paper we concentrate upon qualitative dimensions of systems thinking, not on quantitative conclusions. Systems thinking awareness leads towards systems consciousness, which is necessary in quality life, when searching for solutions in societal realms. Analytical thinking can be of great help when used in order to newly synthesize analyzed elements. Thus, we come to the conclusion that if the observer with an evolved systems thinking understanding, he understands all points of view, also analytical ones, which in this case become the parts of systems solution and this way the complementary ones. The results achieved with conscious systems thinking are optimal for the environment of today and of the future.

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