Soft Systems Methodology Embedded in Organizational Knowledge-Creating Process

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ABSTRACT

We clarify the role of tacit knowing in the soft systems methodology. For the purpose we investigate the basic structure of its seven-stage model, while embedding the soft systems methodology in organizational knowledge-creating process. This leads to the introduction of concept creation to the methodology. This changes the basic shape of the soft systems methodology from learning cycle to organizational knowledge-creating spiral where concept creation is the key point.

Keywords: knowledge-creating process, soft system methodology, concept creation, driving objective.

1. Introduction

The soft systems methodology (SSM)[1][4] is a methodology for deriving actions towards an organizational change. This methodology was devised from the action research in the 1970s. It is based on the concept of "learning from action".

The procedure of applying the soft systems methodology is divided formally into the seven stages of activities. However, the viewpoint of determining practical actions by a whole procedure, which the seven stages associate tightly together to constitute one whole, is almost neglected. Furthermore, the methodology does not show how to obtain the outcome from each stage. Hence, we feel difficulty in applying the methodology to articulate a set of essential actions towards an organizational change.

We attend these shortcomings, and clarify the association (*1) of the seven stages from the viewpoint of tacit knowing[7], following which we embed SSM in an organizational knowledge-creating process. This will show that SSM is not only a learning process, but also is an organizational knowledge-creating process. Having this finding consciously, we can create a set of the essential actions for an organizational change.

2. Organizational Knowledge-Creating Process

Nonaka and Takeuchi[5] described explicit or codified knowledge as one that is transmittable in formal and systematic language. On the contrary they described tacit knowledge as one that is personal, context-specific, and hard to formalize and communicate. Following these, they define knowledge-creating process as follows. First, individual externalizes ones own tacit knowledge. This makes such knowledge objective and explicit, and hence people share the knowledge. This process synthesizes people's different viewpoints. In the process individual tacit knowledge becomes richer as subjective knowledge in oneself by embodying new knowledge created through such a way.

Note that the externalization[5] is not merely the conversion of tacit knowledge into the corresponding explicit one. Externalization is interpreted as actively shaping or integrating experiences, and creating a new knowledge, as Polanyi[7] has pointed out.

Some terms[6] used in this paper are explained here briefly. The knowledge vision of a firm is drawn from the result of pursuit of the absolute value which describes "how the firm is to be". It becomes a standard of the justification of a set of actions to which we introduce. Practice is positioned towards realization of knowledge vision. It is effective to clarify a concept, a goal, and an action standard to materialize a knowledge vision in a practice. These terms are called a driving objective in the meaning of the target for driving a knowledge-creating process.

3. What tacit knowing is

The basic structure of tacit knowing[7] consists of two kinds of terms called a proximal term and a distal term. One can be aware of the tacit relation which ties up these terms.

There are four aspects in tacit knowing. First, there is the *functional structure* of tacit knowing. We attend a distal term by relying on the awareness of proximal terms. Second, there is the *phenomenal structure* of tacit knowing. We are aware of the proximal term in the figure of the distal term. Third, the whole which a distal term expresses is equivalent to the meaning of what the portions express (This is called *semantic aspect* of tacit knowing). Finally, tacit knowing establishes the meaningful but tacit relation between proximal and distal terms. An entity, which is called a comprehensive entity, of the meaningful relation is recognized by understanding what these two terms jointly constitute.

This shows the *ontological aspect* of tacit knowing.

We know the meaning of a comprehensive entity by indwelling in proximal terms; that is, proximal terms are shaped or integrated actively to emerge their meaning. On the other hand, pursuing for clearness about proximal terms and the relation between proximal and distal terms extinguishes the meaning of a comprehensive entity (*2).

4. Idea and Organizational Knowledge-Creating Process

Shimizu[8] explains the importance of frequent both-way traffics between experience and abstraction, although it is the context of writing essays. He says that idea must be melted to experience. He says that experience must be crystallized into idea. As being quoted Bergson, he further says that the efforts for trying to melt idea and crystallize experience leave experience which plays the role similar to ordinary idea, and make clear but internal image.

Idea is subjective[3][8]. There are two kinds of ideas. One is an idea like a flower, which an idea corresponds to an objective fact that a thing exists and it can be touched by hand. Many of ordinary ideas which are crystallized as the essence of concrete experience and which many people have already known go into this category. Since such ideas correspond to the objective facts, it is easy to communicate them to others.

On the other hand, there is idea which does not correspond to any objective fact. "Belief" is an example, which cannot be touched by hand, and hence we must depend only on the language. But it is still difficult to communicate idea like “belief”; hence, we communicate it generally by melting such idea into the world of experiences[8].

Similarly, Nonaka and Toyama[6] assert the importance of the interaction between subjectivity and objectivity in knowledge-creating process. The interaction between individual subjectivity and objectivity makes new ideas. Individuals' ideas are synthesized in an organization and then melted in the world of experiences through practice. Finally, individual crystallizes such experience to further idea. This spiral will be repeated as organizational knowledge-creating process.

In this paper we stand on the viewpoint that the outcome from such organizational knowledge-creating process depends on tacit knowing capability of the individuals in an organization. Hence, the development of this capability should be set to one of the essential purposes of knowledge management. As the first step towards the purpose, tacit knowing aspect of the soft systems methodology is focused on, while embedding the soft systems methodology in an organizational knowledge-creating process in the following sections.

5. Soft Systems Methodology

It is said in SSM that "human beings cannot help attributing meaning to their experienced world; and they can then decide to do some things and not do others. They can take purposeful action in response to their experience of the world([1], p.2)".

The basic shape of SSM creates and implements an accommodation between different interests in the situation, in order to improve the current problematic situation in the confused real world. For this purpose SSM presents the seven stages shown below.

1. Finding out: Draw rich pictures for understanding the problematic situation.
2. Expressing the problem situation: Extract relevant tasks and issues from the rich pictures.
3. Formulating root definitions: Create the root definitions for the purposeful activities to each relevant tasks and issues.
4. Building conceptual models: Build conceptual models which are based on the root definitions.
5. Comparing models and perceived real world: Compare the conceptual models with the actual problematic situation and then derive logically a set of actions for practice.
6. Debating, defining changes: Determine the final set of systemically desirable and culturally feasible actions for practice by considering the organizational culture and different interests. (Accommodation)
7. Taking action: Perform the set of actions.

In principle SSM forms a learning cycle that idea leads to practice, and practice leads to new idea. The interaction of the applied methodology and its outcome is reflected intentionally, and the methodology is changed accordingly. We focus on the learning process for own style of how to improve a problem situation. Here, the methodology stands on the position where it does not exist independently of a user.

Referring Polanyi, furthermore, Checkland and Scholes ([1], p.192) stated that "the methodology itself had better be internalized as tacit knowledge". This paper focuses on tacit knowing capability which is the essence of this tacit knowledge.

6. Embedment of SSM

Concept creation is the key of problem-solving activities because a concept leads to the final solution which is differentiated from others. Although concept creation must be the key of problem solving for such a

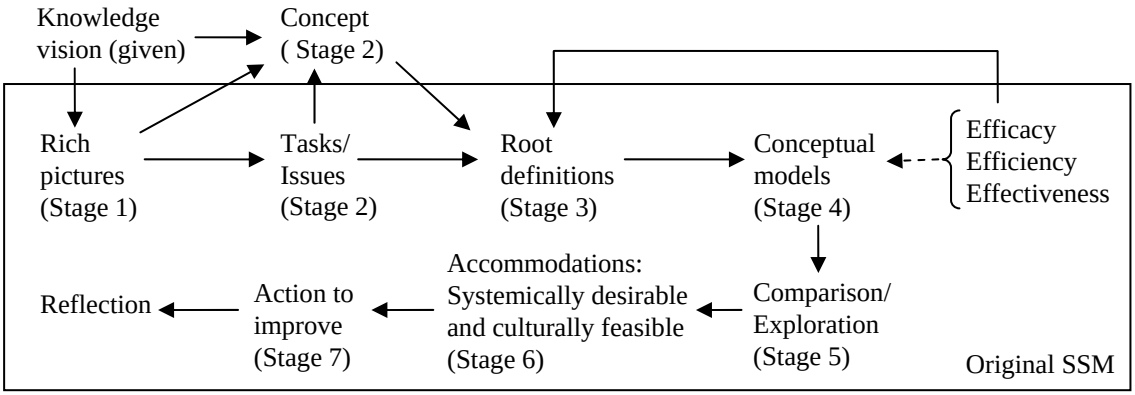

Figure 1. A Cycle of the Extended Soft Systems Methodology

reason, many problem-solving methodologies assume that a concept is given or does not explicitly deal with it. One of such methodologies is SSM.

The organizational knowledge-creating theory[6] points out that it is necessary to have a driving objective that specifies the concrete concept, goal, or action standard to connect knowledge vision with a practical knowledge-creating process. We consider this in SSM below.

In SSM, it is required to create a root definition on stage 3. The conversion or transformation used as the core of a root definition is defined as "a system which performs X by Y in order to attain Z" (XYZ formula). Here Z, Y, and X express the objective of the purposeful activity, "how", and "what", respectively. We derive Z while being based on the concept as the meaning of the rich picture (this will be explained in the next paragraph). We regard X as the "goal" and Y as an "action standard". Then a root definition becomes sufficiently equivalent to a driving objective. A driving objective is introduced into SSM, and SSM is explained from a viewpoint of tacit knowing in the following.

As depicted in Figure 1 SSM starts from drawing a rich picture to understand the essential problematic situation. For example, vitalization of a music hall[4] is an apparent problem, and whoever sees, it is known easily. In the sense such a simple problem is regarded as one of the inputs to a rich picture with the historical background. The purpose of drawing a rich picture is to extract essential tasks and issues in the original SSM. In this paper, furthermore, we propose to create the corresponding concept to the rich picture. This can be achieved by the reason explained in the next paragraph; for the purpose, we draw a rich picture in which we can see the objective facts and are aware of the belief about a problematic situation by referring to the knowledge vision(*3).

A rich picture serves as a distal term of a comprehensive entity which expresses the problematic situation, and the meaning of a comprehensive entity is a concept corresponding to the tasks and issues(*4). This is the mechanism of concept creation in SSM.

A root definition is created from an essential task or issue, and the corresponding concept. Tacit knowing mechanism also operates here, and a root definition has the meaning as a comprehensive entity. In CATWOE analysis about a root definition, transformation corresponds to the change of a situation about X, and the world view is as follows: we can attain Z by Y, which Z is based on a concept, and hence the result of actions satisfies the given knowledge vision.

Next, we build a conceptual model. It belongs to the world of ideas and expresses some activities(*5) that the explorer of a change thinks to have a certain relation to the problem situation. This model is utilized to derive a logical solution on stage 5. On stage 5 we will compare this model with the real world problem situation, where a model is only technically defensible or indefensible(*6). The expressed activities in a conceptual model are evaluated for efficacy, efficiency, and effectiveness while referring to the root definition.

The above concept creation, creation of a root definition, and building of a conceptual model are activities in the world of ideas, that is, the world of systems thinking.

Next, we have to melt the abstraction, called a conceptual model, in the world of experiences. The candidates of actions corresponding to each element are derived comparing a conceptual model with the actual problem situation. These actions are assumed to be practiced in the world of experiences, and hence we can argue them about truth or false. Sufficient logical consideration is possible and it is required for the argument. Furthermore, when we determine some practical actions for an organizational change, it is necessary to be truly practical and effective. For the determination of such actions we attend a set of practical actions as a distal term from the proximal terms including the corporate culture, and determine the set of practical actions to be practiced. We depend on

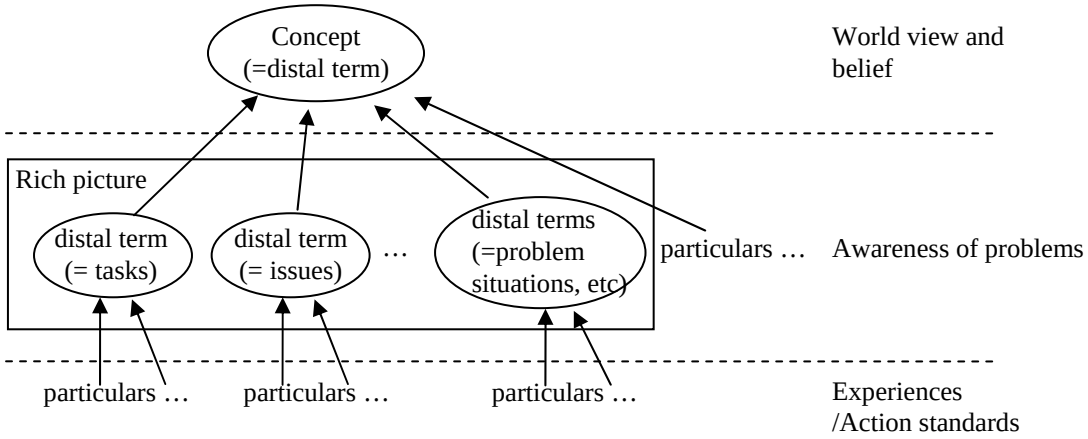

Figure 2. Concept Creation

dialogues in these series of determining the set of practical actions. In the dialogues we must be logical and think about organizational culture.

The mechanism of tacit knowing is working on each stage. However, the power of tacit knowing is gradually reduced as we approach the final stage for the determination of practical actions. The determination of concrete actions requires clearness, unlike concept creation. For this reason logical thinking becomes important, and a purposeful dialogue becomes effective; on the other hand these actions are practiced with tacit knowing. The reflection of the practice will produce a new idea to an individual. Although it may be paradoxical, the action with clear explanation is effective in such reflection.

7. Findings about the methodology

The new feature of SSM shown in the last section is the introduction of the concept creation, and it brings the association to SSM. This idea is based on the principle of marginal control[7], and emerges the creative holism[2] which is different from the performance of the sequential execution of the seven stages.

Figure 2 depicts the mechanism of concept creation. The particulars in the bottom are created from experiences and action standards. We integrate actively these particulars and emerge the distal terms like tasks and issues in rich pictures. Note that the awareness of problems as the organizational principle at the level of drawing rich pictures controls the particulars from experiences in the lower level. The elements of rich pictures, including other particulars at this level, are integrated actively to create the concept in a higher level. The organizational principle at this higher level is the world view and belief.

The created concept controls the entire process of applying SSM, where we deal with the seven stages of SSM to be positioned at the same lower level. In this sense we say that the created concept becomes the organizational principle for the entire seven stages.

Although SSM utilizes concepts, they are dealt with as being given, or drawn from the interaction among root definitions, CATWOE analyses, and conceptual models. These concepts are located at the same level as the rich pictures. On the other hand our concept is created at the higher level on the level of the rich pictures, and it controls the indeterminate boundary on the lower level. This is based on the principle of marginal control.

Because SSM is successfully embedded in organizational knowledge-creating process, a way of applying SSM becomes part of knowledge or capability. Although such knowledge or capability is based on tacit knowing, we can develop them through the reflection of the methodology itself. Accordingly, we can understand the dual structures of the knowledge creation mechanism that we create the target knowledge itself and at the same time develop the capability or way of knowledge creation. This implies that SSM shift to the viewpoint of organizational knowledge-creating process from the one of individual learning process.

8. Conclusion

Some soft system approaches[1][2] utilize reflection, in order to learn about problem situations, and in order to improve those ways of applications. The essence of such reflection is in the improvement of capability of tacit knowing. For the purpose we need to study further about indwelling into proximal terms from the viewpoint of experiences.

Finally, verbal and nonverbal communications are important for the application of SSM. For example, the places for promoting such communications and the elucidation of leadership are important. There are two subjects on knowledge management[6]; one is how the

above problem will be investigated and improved, and the other is how the capability of tacit knowing will be developed.

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(*1) Many contents of experience join together according to a fixed relation, and constitute the one whole.

(*2) The author thinks that tacit knowing is useful to creating essential abstract like concept creation. On the other hand, logical thinking requires the clearness which is useful for the determination of concrete action.

(*3) When we draw rich pictures, we think the interaction among the roles, norms, and values, which are derived from the concept of Vickers's appreciative system. This is closely related to a driving objective.

(*4) Concept is idea, and must be justified only by the action in the world of experiences. A knowledge vision is required in this case.

(*5) This model does not express any problematic situation, and an activity is the abstract concept of an action in the real world.

(*6) A conceptual model is used only for the determination of logical actions which lead to an organizational change. The target situation will be reformed after practice, and then this conceptual model stops having the meaning in the past context.