DOI: 10.33278/SAE-2018.eng.269-272

JEL B41

SYSTEMS THINKING AND COLLECTIVE PROBLEM SOLVING PRACTICES

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Abstract. In most systems methodologies coping with "human" systems, a systems thinking is closely related to practices of solving complex, or "wicked" problems. From the time of A. A. Bogdanov and L. von Bertalanffy systems approaches had an attitude toward overcoming the disciplinary division of sciences, as well as the breaking of theory and practice, so they treated relevant problem situations as "systemic situations". In this paper we consider the typology of "western" collective problem solving practices (it is based on the System Of Systems Methodologies – SOSM) and specific features of the same practices in the Moscow Methodological Circle (MMC) as a representative of "Russian systems thinking". Peculiarity of MMC is that "systemic situations" are schematized in multi-position manner, which opens the prospect of collective problem solving as a multi-position organization of practices. In MMC these practices were implemented in the form of Methodological Seminars (MS) and Organizational-Activity Games (OAG). The model of conceptualization and resolving of systemic situations in these practices is Thinking-Activity Scheme.

Keywords: systems thinking, complex problems, systemic situations, collective problem solving, multi-position organization of practice, the Moscow Methodological Circle (MMC), Thinking-Activity Scheme.

INTRODUCTION

In most systems methodologies coping with "human" systems, a systems thinking is closely related to practices of solving complex, or "wicked" problems. From the time of A. A. Bogdanov and L. von Bertalanffy systems approaches had an attitude toward overcoming the disciplinary division of sciences, as well as the breaking of theory and practice, so they treated relevant problem situations as "systemic situations". In this paper we consider the typology of "western" collective problem solving practices and specific features of the same practices in the Moscow Methodological Circle (MMC) as a representative of "Russian systems thinking".

SOSM AS THE TYPOLOGY OF "WESTERN" COLLECTIVE PROBLEM SOLVING PRACTICES

In 1984 M. Jackson and P. Keys have offered the System Of Systems Methodologies – SOSM [1] which then has been described and presented in various ways. In the book [2] SOSM represents also the typology of systems thinking. It includes four types of systems thinking in the "ideal-type" grid of problem situations or problem contexts:

- Type A: Hard Systems Thinking in wide sense (the problem context is Improving Goal Seeking and Viability);
- Type B: Soft Systems Thinking (the problem context is Exploring Purposes);
- Type C: Emancipatory Systems Thinking (the problem context is Ensuring Fairness);
- Type D: Postmodern Systems Thinking (the problem context is Promoting Diversity).

The grid of problem contexts is two-dimensional (see table 1): the "systems" and "participants" dimensions used to establish

it. The vertical axis expresses a continuum of system types conceptualized at one extreme as relatively simple, at the other as the most complex. The horizontal axis classifies the relationships that can exist between those concerned with the problem context – the participants, or stakeholders – in three types: "unitary", "pluralist" and "coercive".

The first two columns of SOSM correspond to Peter Chekland's distinction of Hard and Soft systems methodologies (see [3] – M. C. Jackson directly refers to this book), and to G. P. Shchedrovitsky's distinction of "System-1" and "System-2" [4]. In 2012 V. G. Maracha has paid attention to this circumstance and suggested putting the concept "System-3" in compliance to the third column, having united Jackson's Type C and Type D in the uniform type of thinking [5].

This idea seems to be worth mentioning because coercive systems are almost always complex (more reasons see in [6]).

So we can consider "participants" axis of SOSM grid as the typology of "western" problem solving practices. And then, in essence, applied systems thinking of types B, C, D (second and third columns, i.e. "System-2" and "System-3") is a process of collective problem solving which includes multi-position interaction and co-ordination.

"RUSSIAN SYSTEMS THINKING": MMC AS A BIG PROJECT AND ITS GENERAL FRAMEWORK

Further we consider MMC as a representative of "Russian systems thinking".

MMC was organized in USSR in the year of J. Stalin's death (1953) and was led for more than forty years by G. P. Shchedrovitsky (1929–1994). Now it exists as the "Methodological Movement" and a few institutions associated with it. The specific approach of MMC is that "systemic situations" are schematized in multi-position manner, which opens the prospect of collective problem solving as a multi-position organization of practices.

If we consider the development of the Moscow Methodological Circle (MMC) as a big project we can determine some requirements to thinking which allows us to change the World [7]:

- holism and reflexivity in relation to the other approaches and types of thinking (in science, design, engineering, socio-cultural and law studies, etc.);
- practical orientation (thinking-activity connections, which uses systems approach as the means for organizing processes of resolving complex problems by multi-professional and transdisciplinary teams, etc.);
- reflectivity as practical orientation of thinking to itself, i.e. its capability to re-construct and re-direct itself;
- the "methodological turn" from thinking about systems as objects to organizing, performing and reflecting the process of systems thinking in practice.

The first feature/principle is systemic one, the second and the third are constructivist, and the fourth follows from Bogdanov's "organizational point of view". These general features and principles have their general framework: the idea of "methodological thinking" as universal and developing process of collective problem solving.

Moving in general framework of the idea of "methodological thinking" as universal and developing from 1953 MMC has generated three R&D programmes for research and development of thinking [8]:

- "Logical Researches of the Thinking" (LRT): thinking is considered epistemologically (as a process of generation of new knowledge) and as a process of operating with the signs replacing objects of thought;
- "General Activity Theory" (GAT) and "System-Activity Approach" (SA);
- "System-Thinking-Activity Approach" (STA) and "System-Institutional Approach" (SI) as its specific kind for social systems and knowledge [7].

THREE MMC PROGRAMMES AND CONCEPTS OF SYSTEM IN SOSM

Systems approach in MMC practice involves three concepts of system [7]:

- "System-1": Natural "Thing" Systems;
- "System-2": Human Activity Systems;
- "System-3": Socio-Cultural Systems, or Systems with "Internal Sense" (e.g. Institutions as a case of Systems with "Internal Sense" in SI Approach).

Three concepts of system within MMC have become results of the different programmes and correspond to different paradigms of systems thinking.

Positions of MMC concepts (and paradigms of thinking) in SOSM are presented in the table 1. It demonstrates that MMC as an intellectual tradition chooses not postmodernist (relativistic), but rather rational answer to the challenge of Postmodern situation. System-Thinking-Activity Approach (STA) is a systemic and thinking-activity constructivism.

Table 1

MMC programmes and concepts of system in SOSM

<table>
<tr><th colspan="2" rowspan="2"></th><th colspan="3">Participants / Stakeholders</th></tr>
<tr><th>Unitary / System-1</th><th>Pluralist / System-2</th><th>Coercive / System-3</th></tr>
<tr><td rowspan="2">Systems</td><td>Simple</td><td rowspan="2">Type A
LRT</td><td rowspan="2">Type B
GAT, SA</td><td>Type C
STA, SI</td></tr>
<tr><td>Complex</td><td>Type D
STA</td></tr>
</table>

Source: [6]

Now MMC systems methodology has three basic components which are the foundations of System-Thinking-Activity Approach (STA):

1) systems thinking (as "methodological thinking" described above);

2) Thinking-Activity Scheme (an intellectual construction called by "scheme" in MMC is a diagram linked to the certain model as its meaning) and moderation technologies;

3) Systemic 3D-Methodology.

THINKING-ACTIVITY SCHEME AS THE MODEL FOR CONCEPTUALIZATION AND ORGANIZING COLLECTIVE PROBLEM SOLVING PROCESS

Thinking-Activity Scheme (published in 1983) is the model for conceptualization, organizing and coordinating collective problem solving process. In this scheme thinking and practical activity are represented in the form of different "layers" ("Pure Thinking" and "Thinking-Action"), divided by a "Thinking-Communication" layer. Links between three layers of Thinking-Activity Scheme are mediated by Reflection and Understanding processes [9]. "Thinking-Communication" layer in Thinking-Activity Scheme provides collectiveness of Thinking-Activity and allows to govern it by the means of moderation technologies. We use them in order to apply STA-Approach to systemic situations from practice.

Moderation technologies are considered as the mode of communicative governance supporting adhocratic type of interaction and deliberative communication [6]. Using Thinking-Activity Scheme with the help of moderation technologies allows researchers and practitioners to bridge systems thinking and systems practice in moderated forms of events organization (seminars, "round tables", transdisciplinary conferences like ISSS etc.) and to do the same in process forms of workflow organization: project groups, foresight, Organizational-Activity Games (OAG), strategic sessions, staff games, civil juries, wisdom councils, etc.

Historically there are two forms of specific MMC systems practice: Methodological Seminar (MS) and OAG. Having originated as a form of discussions and within MMC, step-by-step MS became a form of collective thinking for discussing transdisciplinary problems and considering systems situations in the "here-and-now" mode. The systems approach was used and developed in MMC for organizing collective problem solving processes by multi-professional teams.

Finally, MS generated "a new way of organization and a method for developing collective thinking-activity" – OAG, invented in 1979 [9]. There are many papers which describe living experience of OAG (see references in [6]). As an intellectual

technology OAG could be compared with the Syntegration Method (see: https://www.malik-management.com), but there are some difference in conceptual interpretation and technical details (duration, a number of participants, etc.).

Now Thinking-Activity Scheme is implemented in consulting, education, city and regional development, public policy, public expertise procedures, organizing of public-political communications, conflict resolving and mediation procedures. In future, it will be useful in international relations, cross-cultural interactions, global problems resolving, etc.

CONCLUSIONS

We consider "participants" axis of SOSM grid as the typology of "western" problem solving practices. And then, in essence, applied systems thinking of types B, C, D (i.e. "System-2" and "System-3") is a process of collective problem solving which includes multi-position interaction and co-ordination.

As for MMC participants, in systems approach they were followers of A. Bogdanov. And as Bogdanov anticipated Cybernetics by N. Wiener and General Systems Theory by L. von Bertalanffy (System-1), MMC participants anticipated Soft Systems Methodology by C. W. Churchman, R. Ackoff and P. Checkland (System-2). Now the general framework of Universal and Developing Methodological Thinking is expanding to problem contexts of Emancipatory and Postmodern Systems Thinking (System-3). MMC participants aspire to make methodological thinking capable to cover all field of SOSM and to apply instruments of different systems methodologies creatively and critically.

Thinking-Activity Scheme allows MMC followers to build a communication bridge between systems thinking and systems practice. This scheme includes a set of principles for resolving systemic situations with complex problems by multi-professional teams, i.e. organize and co-ordinate collective problem solving process.

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