

General Theory on Powerful Thinking (OTSM): Digest of Evolution, Theoretical Background, Tools for Practice and Some Domain of Application.

Nikolai Khomenko (Insight Technologies Lab, Canada)

Abstract

OTSM is a Russian acronym proposed by Genrich Altshuller to describe the next evolution of Classical TRIZ. The acronym can be translated into English as the “General Theory on Powerful Thinking” Mr. Altshuller proposed the idea to transition from Classical TRIZ to OTSM in the mid 1970’s. Some background ideas for this transition were developed in the 1980’s, initiating the formal development of OTSM. Altshuller considered Classical TRIZ had matured as a theory about creating tools for solving technical creative (non-typical) problems. When people began using a TRIZ-based toolbox for non-technical applications, Altshuller posed the question: “How should TRIZ be transformed from a theory for solving technical problems into a domain-free theory for solving complex generic problems?” In this paper the results of 25 years of OTSM research are summarized with proposed directions for further development.

Extended Abstract

To understand OTSM (pronounced as Ti- eS- eM) and why Genrich Altshuller proposed such a transition from Classical TRIZ, consider at least three dimensions of Altshuller’s schema for powerful thinking: the Time Dimension, the system Level (Hierarchy) Dimension and the Anti-System Dimension. Specifically, we consider the historical evolution (in time) of a structure (system levels of OTSM-TRIZ) and related problems where OTSM-TRIZ based tools can be used effectively and efficiently.

In this context, the evolution of OTSM-TRIZ proceeded as follows: simple methodology:

- set of methods
- ARIZ as an algorithm that integrated these methods into a unified tool for solving non-typical problems
- TRIZ as a theory for creating effective tools for solving non-typical problems
- OTSM – the General Theory on Powerful Thinking and creating domain-free tools for managing complex non-typical interdisciplinary issues
- First generation of OTSM-based domain-free tools for solving problems including a fractal model of a problem solving process and four main OTSM technologies: New Problem Technology; Typical Solution Technology; Contradiction Technology; Problem Flow Technology.
- Second Generation of OTSM-based toolbox including a Problem Flow Networks (PFN) approach for managing large networks of interdisciplinary issues.

In this paper we deal with questions such as:

- Why did TRIZ evolve to OTSM?

- What factors drove the development of the OTSM-TRIZ methodology and tools?

To answer these questions we compare Altshuller’s TRIZ (Classical TRIZ) and OTSM as two applied scientific theories and consider their structure, theoretical background, and main tools of practice.

OTSM has a structure of postulates that clarify and detail the three postulates of Classical TRIZ formulated by Altshuller. One of most important theoretical developments is OTSM’s fractal model of a problem solving process. The domain-free OTSM tools, which were generated from the fractal model of a problem solving process.

In comparing OTSM and TRIZ-based toolboxes and relationships between tools, we consider:

- Why linear and non-linear educational technologies were developed such as Fairy Tales (used by G. Altshuller) and the Yes-No Game (used by N. Khomenko, T. Sidorchuk).
- Can a computer function as a problem-solving mentor? Some lessons learned from 1986, when a computer was used to mentor the application of ARIZ will be shared.

This paper will also discuss how OTSM-based tools are complementary to many other approaches and can be easily integrated with other tools into a unified system. For this we will introduce both an OTSM ENV model and an Advanced Schema on Powerful thinking