ARIZ in a nutshell: TRIZ Challenger

ARIZ is an algorithm for inventive problem solving developed and revised by G. Altshuller - the father of TRIZ [8] - up to 1985.[1, 5, 6] Since then, without any major improvement to the method itself,[3] the emphasis remains focused on the development of computerized versions (starting with ARIZ-SMV 91 (E), largely based on ARIZ-85C).[12]

ARIZ shows how to use TRIZ modules as a system in order to find the best solutions to the problem. The first phase of this algorithm includes the transfer from an initial formulation to its concept model. It helps to identify the interaction of objects in time and space, the available resources and the ideal final result. Similar to the approach proposed by Kepner-Tregoe,[4] ARIZ has some unique tools to sustain the creative thinking process. Two of them may be mentioned here:

1. A link between the problem ï formulated as a technical contradiction ï and Inventive Principles to solve it [8, 11]

*The identification of a conflicting pair is a key element of Altshuller***ô***s philosophy; the parameter to be improved helps to envision a whole set of techniques, but, as a normal rule, there is a worsening parameter in the system, or* ***ñ****constraint***ò***, which limits the feasibility of the considered solutions. This statement is at the origin of the first TRIZ tools: the table of contradictions and the inventive principles.*[1]

2. A link between an abstract model of the problem and Standard Solutions [8, 11]

The analysis of the interaction between substances and fields of energy follows specific rules. The Standard Solutions to these models, used to increase the efficiency of a function or eliminate undesirable interactions, are sometimes equal to other TRIZ heuristics, but may also be seen as inhomogeneous, inconsistent or too specific.[9]

Some attempts to streamline the algorithm ï i.e. SIT, ASIT [2] or USIT [10] - donôt meet up to the objective because they are based on a few heuristics only, not relevant enough to solve tough technical problems. The computerized versions of ARIZ (i.e. Invention Machine and Ideation software) have their drawbacks too. Besides the fact that they have nothing to do with enhancing creativity, much better and faster free search engines can accomplish the task of retrieving methods of implementing a function.[3]

Although the use of computerized version may be considered superfluous, the need for a simplified process to identify specific solutions remains. Since the terms used are sometimes too vague to suggest some advanced solutions, ARIZ certainly requires a more precise semantics and more explicit heuristics.

Based on these critiques, TRIZ Challenger[7] appears as a new interactive application, which allows a quick and systematic look on the most promising opportunities. The key features of this tool are the following:

- A narrow definition of each parameter and inventive principle
- Inventive principles (or subcategories) linked to technical solutions or scientific effects.

The first phase of the creative thinking process based on TRIZ Challenger helps to envision an ideal final result with minimal changes to the system.

The second phase is an attempt to list a maximum of interesting ideas with use of ñother fields of forceò. Based on the correct settings of the conflicting parameters, up to six innovative principles to solve the problem are generated automatically. Here the similarities of TRIZ Challenger with the table of contradictions elaborated by G. Altshuller are quite obvious. But the conflicting pair of parameters is much easier to identify.

Last but not least, technical opportunities - scientific effects or solutions - may be checked directly through a link with an online encyclopaedia.

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