The undervalued innovation potential

Industrial application of TRIZ delivers more breakthroughs to less cost - if the right tools are applied at the right time and place.

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Despite best efforts of the last decade, 60 to 70 percent of all initiatives pursued by the European companies to integrate TRIZ into their innovation process are abandoned or fail, resulting in wasted expenditures and disappointment[1]. Of those initiatives that do succeed, most end in products that deliver sustainable or incremental improvements while less than 10% result in breakthrough solutions. As a consequence the innovation potential of TRIZ still remains undervalued within the companies.

To analyze the situation more deeply we used our TriSolver software for innovation management that enables companies to document automatically the origin of each idea at every stage of the product development process. With less effort one can evaluate what TRIZ tools are more effective and what innovation methods often help to achieve breakthrough solutions. Analyzing numerous industrial projects, TriSolver has discovered the factors that lead to low process yields in TRIZ application and developed recommendations for optimization of the well known practices and tools.

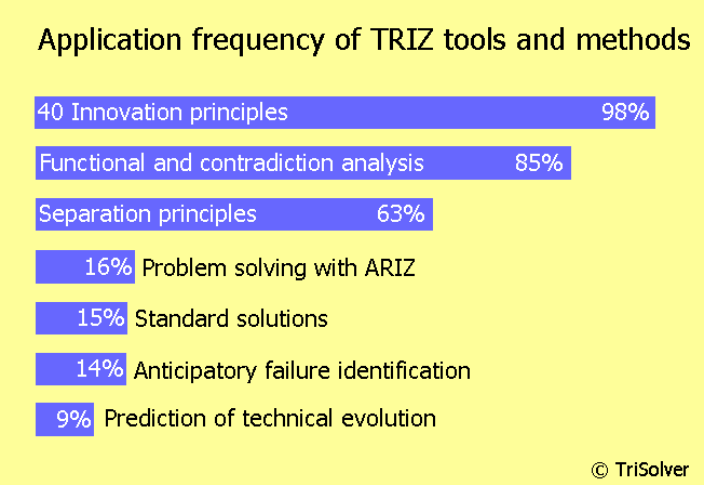


Diagram 1

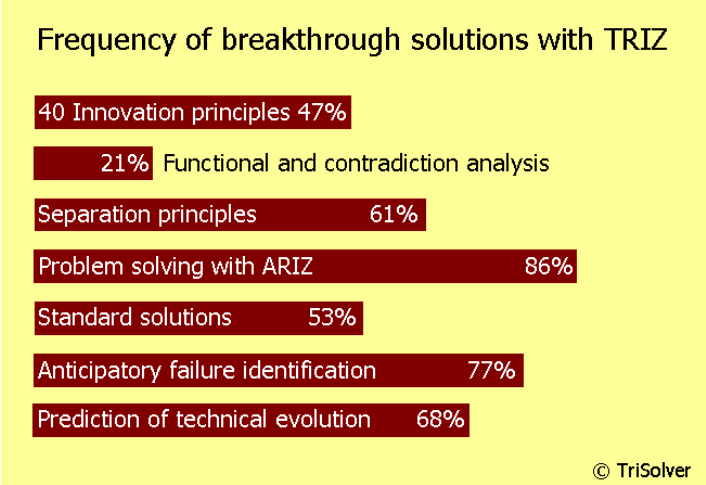


Diagram 2

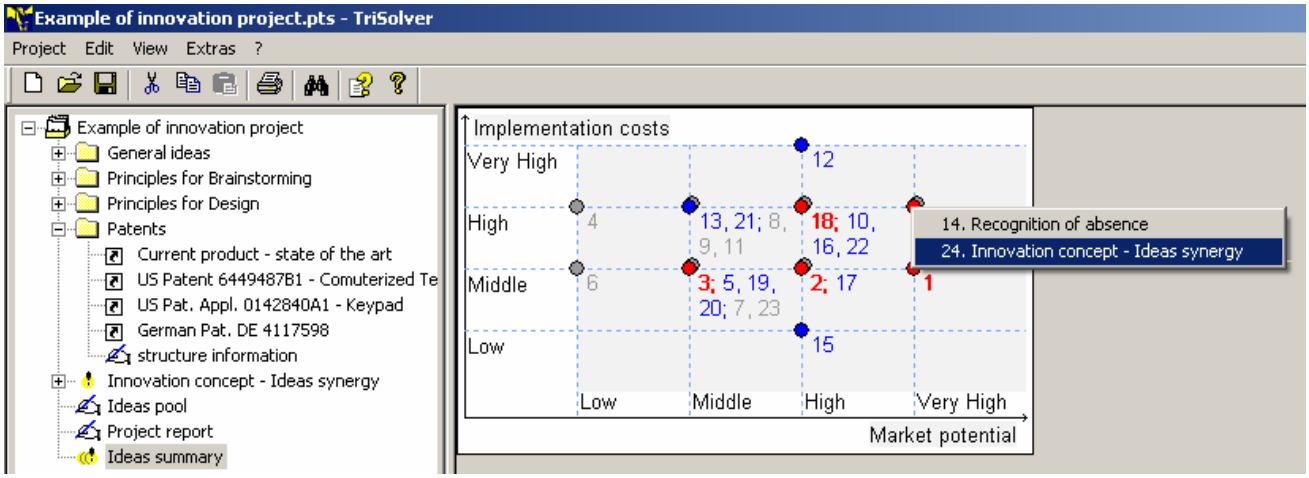
Following statistics (see diagram 1) demonstrates the frequency of application of the TRIZ tools in the industrial innovation or problem solving projects. Although formulated about 30 years ago, the 40 Altshuller's Innovation Principles [1] have remained till now the most popular TRIZ tool, used in 98% of all projects. The reason for this fact is obvious: principles are simple to use or modify and can be easily integrated in brainstorming or daily engineer's work. In general the 40 principles are good to enhance technical creativity but only scratch the surface of the problem in complicated situations [2]. No less effective are the 12 double general principles for solving both technical and non-technical tasks [3, 5]. Application experience of the Contradiction Matrix over the years demonstrates however no considerable advantages in quality of solutions in comparison with the direct use of the 40 principles. As not the Matrix but the Principles remain crucial for problem solving, also the best and fullest matrix does not guarantee the solution of difficult problem.

[1] - Results of the internal TriSolver investigation, performed between 1997 and 2004 in more than 600 industrial companies in Germany, Switzerland, Austria and other European countries.

To identify the best practices in problem solving with TRIZ, TriSolver offered a method of idea or patent portfolio that easily helps to define the market potential of ideas and their risk or costs as well in 4 levels of importance that can be assigned to each idea: low, middle, high and very high. The ideas with high to very high market potentials and low to average costs can be obviously selected as candidates for the breakthrough solutions (see ideas N. 1, 2, 15, 17 in the lower right quadrant in Fig. 1).

The diagram No.2 illustrates from this position, which TRIZ tools are less effective and what methods help to achieve "strong" ideas. In other words it shows how frequent the utilization of definite TRIZ tools resulted in breakthrough ideas or concepts. The winner of this statistical analysis are predictably the ARIZ based TriSolver-Method[2] from one hand and surprisingly the Method of the Anticipatory Failure Identification (also know as a "subversive" analysis) from the other hand. Comparing both diagrams 1 and 2 one can prove that companies undervalue the ARIZ and the Method of the Anticipatory Failure Identification using them groundless seldom.

Fig. 1: Example of idea evaluation[3] within the TriSolver software [5].



The high potential of ARIZ-approach in the practice was indirectly conformed by a separate investigation [4], where the extremely high composite score of solutions was achieved in application both of innovation and separation principles for resolving technical and physical contradictions respectively in the same problems.

In the Method of the Anticipatory Failure Identification the failures are "invented" in a subversive manner, as it is well known. Once a list of "invented" failure scenarios is completed, the problem must be re-inverted and the failures must be prevented from ever happening. This approach leads in the praxis very frequently to new product concepts with higher reliability and less cost.

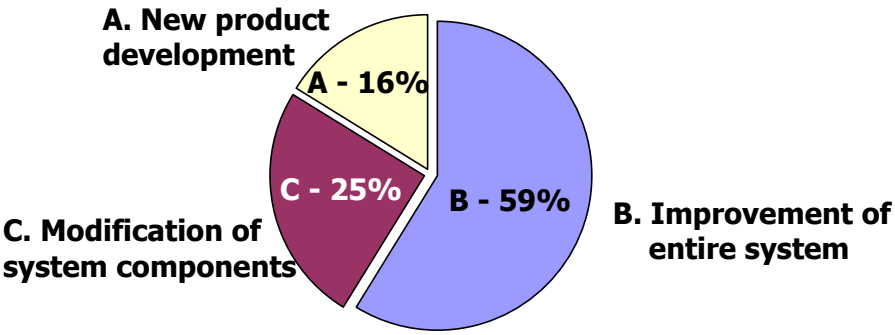
The utilization of the TRIZ methods and tools, selected for our analysis, was performed within more than 30 innovation projects, which can be described as a 5-step process that includes

1. Defining the innovation tasks (see fig. 2)
2. Analyzing initial situation and technical system
3. Idea generation and problem solving
4. Evaluating ideas
5. Developing and evaluating concepts

[2] The TriSolver method is an approach for comprehensive search for innovation solutions. Its problem solving part is based on the proven Inventive Algorithm ARIZ-85, which was adapted and streamlined for fast application by the industrial user without expert knowledge in TRIZ [3, 5].
[3] Ideas with the highest priority 1 are displayed in red and those with a priority of 2 are displayed in blue.

The figure 2 demonstrates three types of task levels in accordance to problem difficulty, wherein on task level C (partial system improvement) the satisfactory solution could be found in 2 days, and on the levels B (improvement of entire system) and A (development of totally new products) the projects were completed successfully in 4 and 12 weeks respectively.

Fig. 2: Three typical levels of TRIZ support of the innovation tasks.



In our next publication we plan to present some real case studies and application examples of the Anticipatory Failure Identification and of the comprehensive search for solution with the TriSolver innovation approach. Professional exploitation of these tools enables companies to make dramatic improvements in time to market as it aligns the marketing and development efforts. Product and service concepts that have a 90% chance of success are typically delivered in less than 3 months. Design prototypes and intellectual property evaluations are run in parallel and are completed soon thereafter.

References

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