Valeri Souchkov:
TRIZ-Related Research and Development Activities

Revised: May 2013.
The list of publications is provided separately.

2009-current	***Subject:*** Study of regularities and patterns of functionality evolution in technological, business and social systems. Formulating the generic Trend of Functionality Evolution. ***Novelty:*** Trend of Functionality Evolution was proposed as addition to the Theory of Engineering Systems Evolution. ***Practical Application:*** The approach has been tested in a number of projects for innovation roadmapping in technology and business projects. The Trend of Functionality Evolution is included in the advanced curricula of TRIZ training courses both in academia and industry. ***Reference in the list of publications:*** 52
2008-current	***Subject:*** Development of a framework for Systematic Business Model Innovation based on combination of Business Model Canvas and a number of TRIZ analytical and creative tools adapted to the area of business and management. ***Novelty:*** • Introduces a systematic and structured approach to the analysis and innovative improvement of business models. • The first approach which combines TRIZ and business model innovation. ***Practical Application:*** The approach was tested during several projects to improve business performance of organizations and create new ideas for various components of organizational business models. A number of innovative ideas on changing the existing business models were proposed and implemented. ***Reference in the list of publications:*** 48
2007-current	***Subject:*** Development of a method and technique for identifying contradictions that block further system evolution based on the analysis of customer demands and market trends with respect to qualitative values of the current system ("Value Conflict Mapping"). The results of analysis are presented in visual form as a set of interlinked contradiction trees. The method is domain-independent. ***Novelty:*** • The method enables to identify key system components that block further system evolution. • The method helps to define and formulate key contradictions that must be solved in order to evolve the system further. • The method helps to discover hidden contradictions and establish new innovation opportunities. ***Practical Application:*** The tool was applied in a number of projects to provide the analysis of complex systems and identify strategic directions of innovation. A current version of the method is included to the advanced curricula of TRIZ training courses both in academia and industry. ***References in the list of publications:*** 5, 6, 46
2001-current	***Subject:*** Development of a method and technique for causal problem exploration and analysis ("Root Conflict Analysis") in terms of contradictions. The technique is domain-independent and is based on the concepts from the methods of Cause and Effect Analysis, Theory of Constraints and TRIZ. The technique enables structuring and visualizing contradictions which emerge in a system and cause a problem. A method of ranking and selecting contradictions was proposed. **Novelty:** • Enables top-down decomposition of a main negative effect to causes, contradictions, and positive effects.

	• Establishes rules to stop analysis of a particular chain of analysis. • Defines types of root contradictions. • Defines ideality-based criteria to rank the contradictions in the RCA+ diagram and to select what contradiction has to be selected for further contradiction elimination. ***Practical Application:*** Since 2003, the method has been widely applied to analyze inventive problems in technology, business, and social areas. Over 300 projects were reported which used RCA+ to analyze inventive problems and situations. A current version of the method is included in the basic curricula of TRIZ training courses both in academia and industry. ***References in the list of publications*:** 5, 6, 25, 42, 44, 45, 48
1998-current	***Subject:*** Adaptation of main TRIZ techniques for application in the areas of business and management ***Novelty:*** Identifies how a number of tools of TRIZ can be used within the areas of business and management. ***Practical Application:*** The approach has been used to solve a number of problems related to business and management conflicts at a number of business organizations. The approach is included to the curricula of TRIZ training course on TRIZ in Business and Management was proposed and is being integrated to the training curricula of MBA and DBA by TiasNimbas Business School in the Netherlands. ***References in the list of publications:*** 6, 44, 54, 56, 59
2011	***Subject:*** Development of a classification of value innovation tasks with references to supporting TRIZ tools to identify innovation strategies and expected results. ***Novelty:*** A new categorization of innovative tasks is proposed. ***Practical Application:*** This approach is used at the beginning stage to prioritize future strategic innovative activities and projects. The classification is included to the basic curricula of TRIZ training courses both in academia and industry. ***Reference in the list of publications:*** 67
2007	***Subject:*** Development of the Ideas Landscaping visual representation method based on combination of Multi-Criteria Decision Matrix, Generic TRIZ Ideality Criteria and expert evaluations. The tool introduces four quadrants to create the two-dimensional ideas landscape with respect to "Idea Power – Idea Estimated Implementation Time". Three-dimensional landscape can be created as well by adding "Complexity of Secondary Problems" dimension. ***Novelty:*** A new approach to evaluation generated ideas is proposed. ***Practical Application:*** The tool is used in each project to evaluate ideas generated. The method is included in the basic curricula of TRIZ training courses both in academia and industry. ***References in the list of publications***: 5, 6
2006	***Subject:*** Proposing a refined way for the classification of solutions to five levels based on the "Principle – Function – Market" combination. ***Novelty:*** An updated approach to the classification of ideas helps to classify inventive and non-inventive solutions in a more structured way. ***Practical Application:*** At the beginning of an innovative project to estimate what level of solution is required, as well as at the end of the project during the project assessment. The classification is included in the basic curricula of TRIZ training courses both in academia and industry. ***Reference in the list of publications:*** 27
2006	***Subject:*** Development of a method and technique for identifying and representing problems in terms of contradictions and functional insufficiencies based on Multi-Screen Analysis of technical systems evolution.

	Novelty: Structures the use of Multi-Screen Analysis on the basis of discovering continuous functional inefficiencies and evolutionary contradictions. ***Practical Application:*** The method was tested in a number of projects to identify evolutionary contradictions and continuous functional inefficiencies. The method is included in the advanced curricula of TRIZ training courses both in academia and industry. ***References in the list of publications:*** 5, 6
2004	**Subject:** Development of a method and a technique "Demand – Trend Matrix" for quick application of the TRIZ Trends and Lines of Evolution to generate innovation trees and roadmaps on the basis of parametric and component decomposition of technical systems. ***Novelty:*** Quick application of the TRIZ Trends and Lines of Evolution to the components of technical system in the matrix form. ***Practical Application:*** The method was used in a number of projects to generate innovation roadmaps. ***Reference in the list of publications:*** 61
1992-1997	***Subject:*** Development of a sharable ontology for representing physical knowledge in unified form using System Theory approach. Development of automated reasoning mechanism for generating new innovative design concepts with the use of Artificial Intelligence knowledge-based techniques. Development of a modelling framework for representing technical systems in the ontological terms and solving inventive problems with the use of TRIZ Inventive Standards. Results are presented in a monograph. ***Novelty:*** • A sharable ontology of physical knowledge for the use in innovative engineering design was introduced. • A system of concepts for modelling technical systems in terms of System Theory notations was proposed. • An algorithm of automated problem solving with the use of TRIZ Inventive Standards was formulated. • A test case with solving a real technical problem with the proposed approach was performed. ***Practical Application:*** The project had scientific orientation. ***References in the list of publications:*** 1, 10, 32, 34, 35
1988-1991	***Subject:*** Development of a computer algorithm and software implementation of the system of 76 TRIZ Inventive Standards. ***Novelty:*** The first software supporting the use of TRIZ including the system of 76 Inventive Standards and the Algorithm of the Use of Inventive Standards was developed. ***Practical Application:*** By the users of Invention Machine software to support innovative projects. ***References in the list of publications:*** 7, 8, 9, 29