Preview of a new English Translation of a TRIZ book by Vladimir Petrov

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INTRODUCTION

Dear reader, I'd like to introduce you to the first book in the series "Professional TRIZ."[1]

The theory of inventive problem solving (TRIZ) is a science that allows creative problems in any field of knowledge to be revealed and solved, while developing creative (inventive) thinking skills and a creative personality. Often at the root of a problem's solution lies what seems at first glance to be a wild idea. TRIZ gives one the ability to not only to be prepared for such ideas, but to create them. **Genrich Altshuller** was the creator of TRIZ.

This series of books will help you deal with many problems, simplify your work and life, and make everything you do more interesting and creative.

After becoming acquainted with TRIZ, many change their life as a result. Their circle of interests expands, their knowledge deepens, and people see the world more systematically as they become used to seeking out cause-effect relationships. For some, TRIZ becomes their profession, their lifestyle.

Here are some of the more common replies to the question:

"What has knowledge of TRIZ done for you?":

- Ability to locate the essence of a problem.
- Ability to correctly determine basic search directives without omitting many moments that are usually overlooked.
- Knowledge of how to systematize information searches according to the choice of problem and search directives of the solution.
- Able to find solution paths deviating from traditional solutions.
- Ability to think logically, illogically and systematically.
- Significant improvement of the creative process's effectiveness.
- Shortened time needed for problem solving.
- Able to look at objects and occurrences in a new way.
- Given the stimulus to invent.
- Widened horizons.

However, I'd like to caution against the common misassumption that one need only to become acquainted with TRIZ – and instantaneously the effectiveness of one's work will increase. It is not that simple. To master TRIZ it is necessary to invest much effort, as in the study of any other science. Even more effort is required to make the application of TRIZ habitual. The stages of acquiring a particular skill were superbly formulated by the great Russian director and theatrical school founder, Konstantin Stanislavsky: "The complex must be made simple, the simple – habitual, and the habitual – pleasant." Further he speaks of the road to achieving this:

"Far from everyone has the will and perseverance necessary to reach true art – knowing a system is not enough. It is necessary to understand how to do something, and to be able to do it. For

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[1] The first edition of this book was written after the loss of Esther Zlotin, although much of the material was prepared jointly. The first edition of the book was published in 1999**. Zlotin E. Petrov V. Vvedenie v TRIZ.** Tel-Aviv, 1999. The book can be accessed at the web site: http://www.trizminsk.org/e/23110.htm**.** The next edition of the book appeared in 2000. **Petrov V. Osnovy teorii resheniia izobretatel'skikh zadach. –** Tel-Aviv, 2000. http://www.trizfido.narod.ru/00/petrov.htm
Petrov V. Bazovoi kurs po teorii resheniia izibretatel'skikh zadach. – Tel-Aviv, 2000**.** http://www.natm.ru/triz/articles/petrov/00.htm

this daily, constant training is vital, regimentation over the course of an entire artistic career."[2] A more detailed description is given in the conclusion.

TRIZ is winning ever more minds throughout the world. TRIZ computer programs have been developed. Firms have been created to practice TRIZ. In addition to the countries of the former USSR, TRIZ has spread throughout the USA, Canada, Europe, Israel, Australia, Japan, the countries of South-East Asia and South America.

Companies specializing in the application and development of TRIZ work in many countries of the world. For example, in the USA, Canada, Germany, England, France, Sweden, Switzerland, Austria, the Netherlands, Finland, Italy, Israel, the Czech Republic, Japan, South Korea, Russia, and other countries. Courses on TRIZ are taught in a number of universities in the USA, Canada, France, England, Germany, Switzerland, Israel, Japan, and Russia.

Engineers and scholars study TRIZ, as well as university students of different disciplines and school children of all ages.

Lessons with preschoolers take place, beginning with three year olds.

There are TRIZ courses for preparing kindergarten teachers, schoolteachers and university lectures. A great deal of work is taking place to prepare methodological educational material.

Several firms develop and sell computer programs about TRIZ.

The most common consultation activity sought by industrial firms is the solution of industrial and scientific problems and formulating perspective solutions.

The American companies GEN3 Partners, Ideation International Inc. have achieved significant success in the sphere of consulting.

Among companies that develop and sell computer programs, the more successful ones are Invention Machine Corp., Ideation International Inc. These firms serve the world's leading firms.

Several TRIZ departments have been created in universities, and dissertations on TRIZ are defended.

The students and followers of TRIZ's creator – Genrich Altshuller – now live and work in many countries. They continue to develop TRIZ, apply it in practice, and achieve remarkable results. It is fair to consider TRIZ, which, at the heart of things, was created by one person, the science of the 21st century.

The **International TRIZ Association (MA TRIZ)**[3] was created and continues to work successfully, the president of which to his final days was Genrich Altshuller. Now MA TRIZ is headed by his students. The European TRIZ Association[4] was formed, and there are also regional TRIZ Associations in the USA, France, England, the Netherlands, Israel, the former countries of the Soviet Union, and others[5].

In the USA **The Altshuller Institute**[6] was created.

The TRIZ Journal is published regularly.

The Internet contains several hundred sites and several thousand links devoted to TRIZ. A list of sites is given in Appendix 13.

International TRIZ conferences take place. The most important newspapers and magazines in the USA and other countries have written about the unusual power of TRIZ more than once. Likewise, the world's most important TV channels have also repeatedly broadcasted programs about TRIZ.

All the things described above are elements of the TRIZ movement created by Genrich Altshuller.

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[2] **Stanislavskii K. S. Rabota aktera nad soboi**. Ch. I.-L., 1948, p. 13.

[3] MA TRIZ site - http://matriz.karelia.ru

[4] ETRIA - European TRIZ Association site - http://www.etria.net/

[5] A list of all the regional TRIZ associations is located on the MATRIZ site.

[6] The Altshuller Institute site - http://www.aitriz.org

Recommendations for the effective use of this book

This book is an introductory course. It familiarizes the reader with the basic concepts and instruments of TRIZ. The information contained in this book is sufficient to achieve a general knowledge of TRIZ and its practical use.

The book is written in the order in which the author recommends that TRIZ be studied. The author supports the step method of studying different disciplines for an adult audience. This is especially relevant to the study of such a multi-faceted science as TRIZ, a fact that has been proven by over thirty years of experience in teaching TRIZ.

The step method of studying a subject is the transition from general to specific, from a superficial examination of the entire system to the extensive study of details.

Initially the entire system is shown as a whole, the purpose of each of the parts is described and their interconnections are clarified.

At the next stage, one of the system parts is examined as an independent whole. Its structure is described, as well as the purpose of each of the sub-parts and their interconnections.

Next the subparts are examined. When needed, some elements of other system parts are included.

Later we return to the general system. The examined part's place is shown in the general system, and we proceed to examination of the next part.

In this manner, all the separate parts are examined as well as their interconnections in the system. All of this is considered the first level of study.

At the following levels a certain part is studied in detail, describing subtleties that were premature during the initial examination and would have distracted from the main points or complicated their understanding. We will demonstrate the methodology of the step system of studying a subject with the structure of this book.

The **introduction** familiarizes the reader with a short history of the methods of invention.

Chapter one presents TRIZ as an entire system. The structure and function of TRIZ are revealed, and its parts are briefly described.

Having read this chapter, you will see TRIZ from a "bird's eye view" – the theory is presented in the most general way. Chapter one constitutes its own kind of guide to the book. If you do not have the desire or ability to read the entire book or to read it in the order determined by the author, you may create a personal plan for reading the book.

Chapter two describes the simplest techniques of invention. They are easy and quick to master. Their use allows the first practical results to be achieved and confidence in your powers and ability to learn the following material to be gained. In this manner, the material may serve as an introduction to the study of TRIZ.

Every following chapter begins with a description of its structure and purpose. Elements of this structure are examined in the paragraphs and sub-paragraphs.

Chapter three familiarizes the reader with the basic structure of the laws for developing systems. An explanation of each of the laws is given, their interconnections are shown, and several of them are described in detail. This material is of the utmost importance for a general understanding of TRIZ because it constitutes the foundation of the theory. The remaining sections of TRIZ in one way or another rely on the laws of developing systems and are a result of them.

Knowledge of the laws of developing systems is of the utmost importance for the formation of **powerful (inventive) thinking.**

Chapter 4 is dedicated to the Algorithm for the Solution of Inventive Problems (ARIZ). ARIZ constitutes a program (a sequence of actions) for the exposure and solution of contradictions, i.e., the solution of the problem. Systematic use of ARIZ changes a person's thinking patterns, teaching one to seek cause-effect relationships – one of the component parts of powerful thinking.

Chapter 5 examines so called “sufield analysis.” This allows structural models of the initial system to be presented. With the help of sufield analysis the characteristics of the problem model are revealed, and with the help of special rules the problem is transformed, eventually resulting in the structure of the problem that eliminates the shortcomings of the initial problem. These models allow one to investigate the initial situation better, and the rules for their transformation not only allow the problem to be solved, but also suggest future solutions.

Chapter six describes the TRIZ knowledge base. This includes: a system of typical solutions for a certain class of problem (so called “standards for the solution of inventive problems”); different effects (*physical*, *chemical*, *biological*, *mathematical*, and particularly, *geometric*) and tables for their use, techniques for eliminating contradictions and tables for their use, and resources of nature and technology and methods for their use. This material is most often used during the solution of specific inventive problems.

Chapter 7 presents methods for the development of a creative imagination, a creative personality, and creative communities. This material is helpful for the formulation of powerful thinking skills and also describes the characteristics of a creative personality and the corresponding life strategy and tactics. This chapter contains several of the laws for developing creative communities.

Chapter 8 gives a short life history of the creator of TRIZ – Genrich Altshuller – and some facts about the author of this book.

The extensive **appendices** contained in the book consist of information indispensable for everyday use. Separate appendices contain diagrams of the content of several chapters of the book (laws of developing systems and sufield analysis). They can be used as quick reference tool after TRIZ has been learned. Other appendices describe specific instruments of TRIZ – ARIZ and the knowledge base. The last two appendices provide the algorithm for use of TRIZ instruments and an annotated list of the primary TRIZ sites.

The **conclusion** gives recommendations for how to improve and broaden one’s knowledge in the field of TRIZ and advice on how to become a TRIZ professional.

To ease the use of the book and to allow any material to be located quickly, the book contains a system for searches in the form of an **alphabetical index** and a detailed **table of contents**.

The next books in the series “Professional TRIZ” are dedicated to a detailed study of the separate aspects of TRIZ.

Books on the following topics have been issued:

- Laws of developing systems,
- Algorithm for the solution of inventive problems (ARIZ),
- Sufield analysis.

A book on a new system of standards for the solution of inventive problems is being prepared for print.

Books on the following topics are in the process of development:

- engineering effects.
- resources
- development of a creative imagination.

The book is intended for engineers and inventors, scientists and people who solve creative problems, university and college students.

It may be useful for university instructors, school teachers and high school students.

Dear reader, I wish you success in mastering the so necessary and fascinating science of TRIZ.

Acknowledgments

This series of books saw the light of day after the loss of Genrich Altshuller and Esther Zlotin.

I extremely indebted to my teacher and friend Genrich Altshuller, above all for creating this fascinating theory, for his genius and astonishing qualities that are partly revealed in his biography. I am grateful to him for unforgettable time we spent together with him and for the fact that he changed my life, made it more varied and interesting. The series of books was discussed many times with Genrich Altshuller. He freely procured different materials and examples for previous books and for this series, as well as made valuable comments and suggestions for their improvement.

I am indebted to Esther Zlotin for very much – my wife and companion in TRIZ and many other undertakings. We constantly experienced the pleasure of joint activity in TRIZ. With her it was very pleasant and easy to give lectures to adults, to undertake studies with children, to discuss and write new works, to solve practical problems for different firms, to practice different public activities in the TRIZ movement, and even to debate different topics. She creatively carried out many organizational activities and always carried on her delicate shoulders an exceptionally large and varied load of work.

In conclusion I would like to express my sincere gratitude to my friends and colleagues Valentina Zhuravleva, Volyuslav Mitrofanov, Boris Goldovky, Gennady Ivanov and Aleksander Ochnev (Russia), Anatoly Gin and Viktor Timokhov (Belarussia), Boris Zlotin, Alla Zusman, Semyen Litvin, Leonid Kaplan (USA), and Peres Amyuel (Isreal) for their valuable advice and comments, given during the creation of the book, Ilya Chernyakov (Israel) and especially Viktor Timokhov for their editing work, and similarly many others, who gave support and help during work on this series of books.