

Book Review: **Inventive Thinking through TRIZ** by Michael Orloff

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Title: Inventive Thinking through TRIZ: A Practical Guide, 332 pages, 329 examples, 228 figures

Author: Michael A. Orloff

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As with other TRIZ books, the reader will find an author that wants to develop TRIZ further and that has its own approach to creativity derived from TRIZ combined with other techniques. However the reader will find as well, an author who loves TRIZ, who honors TRIZ and who is part of the TRIZ history. The book is aimed at being a self-study textbook for inventing “in a technically creative work environment”. The thoroughness of the book requires adequate time to grasp all the richness of the text and methods there, some times “academically” described. The author guides the reader in learning inventiveness through TRIZ, historically driven, step by step pouring TRIZ concepts and valuable simplifications of it. For that, the author uses the “key concept: Re-inventing”. By trying to reinvent known devices and situations by using TRIZ principles and techniques, M. Orloff wants to uncover them to the reader. In his own words “reinventing works as if the users already knew the principles and procedures for a solution to the problem that their invention then address” In our opinion this is a good method but has its penalties because for the reader unfamiliar with TRIZ some concepts can be cumbersome or pass a little unnoticed until he/her arrives to the main part of the book. Besides it might reinforce the trial and error native inertia of such a reader, in the beginning. Later on, the author covers extensively several approaches and explanations of all the tools of TRIZ. This may compel the reader to go through some chapters several times to fully grab the knowledge.

The book begins with a sort of metaphysical reasoning behind TRIZ with very nice examples. A small difficulty for readers not previously introduced to TRIZ is that some concepts are discussed assuming understanding prior to their being fully described, *e.g.* Ideal Final Result. This is probably OK in concept, but it continues the TRIZ characteristic of jargon and coined phrases. We find Orloff's use of Latin and other famous quotations sheds pleasant light on the topic at hand.

While written in a very inviting style, this book was not well translated, and not well edited. Example: Page 26: "The laboratory received more than 600 patents in the first 6 years of its existence, meaning 1 patent per week." This should have read, 'meaning about 2 patents per week.' Edison's Laboratory was in Menlo Park, N.J., not Menlow Park. Page 32 (Fig 4.4) "phantastic" is normally spelled 'fantastic' in English. These distractions litter the book, and cause readers to slow down to interpret sentences, sometimes at the expense of context.

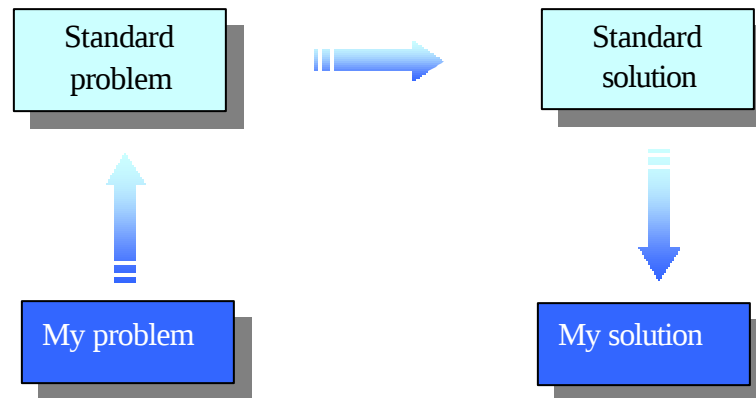
While the first 4 chapters were interesting, and perhaps put TRIZ into a context of creative methods, Orloff also omitted dozens of other creativity and inventive tools which are in use today such as Buzan's "Mind Mapping", DeBono's "Six Hats", or Prather's "Bottom Line Innovation".

As Chapter 6 gets underway, Orloff suggests that Altshuller's great contribution was the accumulation of millions of patents and the experience of millions of inventors. We disagree. Altshullers' great accomplishment was to sort all these into reproducible patterns, and to provide a way to fit the pattern of a new problem into all those of the past to lead to a large number of candidate solutions to this new problem.

What this book offers:

- A reasonably well-organized approach to TRIZ, and good practical examples for putting it to use, and many refreshing problems.
- A pleasantly readable writing style, other than the rough translation and cosmetic glitches (described below).
- Refreshing and original examples, both in text, and along with the Principles.
- A nice cross-reference between the 40 Principles and the Separation Principles.
- Very nice translations of Altshuller's descriptors for the 40 Principles.
- His presentation of the table of 40 Principles was very nice, and easier to read than many.
- Orloff's meta-TRIZ (chapter 7) presents some interesting ways of analyzing a problem which creates a wider expanse of solution possibilities. The examples here were generally quite interesting, and novel.
- His section on lines of technical development, Chapter 15, is one of the best presentations available in English.

- Remarkable is also the “meta-algorithm” which helps those unfamiliar with TRIZ but even those who know the subject, to understand what ARIZ is by descending in a simpler position that resembles the minimal expression of TRIZ scope and of ARIZ with the famous 4 boxes:



The author when referring to the boxes uses the functions of such boxes instead of the names, by calling them “diagnostics – reduction – transformation - verification” which helps to understand the transformations of the initial problem up to verifying if the solution has contradictions solved. The author recognizes that stepping from one box to another is not easy but teaches how to think by using lots of simple examples, illustrated with clear very well defined drawings.

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What this book could use to make it stronger:

- A second edition, thoroughly proof-read by a person who is fluent in English and knowledgeable about TRIZ. Many spellings are not correct, some of them leading to confusion. Many sentences read very awkwardly. Many words are not the appropriate word for English (example: use of the word, "balloons" on page 57, rather than 'gas cylinders'). These glitches slow the reading rate too much, and in many cases, force re-reading of individual sentences many times in order to find out what he was really trying to say. Fluent English would really turn this into a great book.
- Better translation of words like 'praxis' and 'heuristic', while appropriate in usage, are rarely used in North American English, and would send many running back to the dictionary. Most of the spelling in the book is British in character (*e.g.* colour), or German (*e.g.* Natur, Rockett).
- Replace the Spanish-style quote marks (*e.g.* „tiny people “) which are fairly distracting at first (but readers can eventually accommodate to this).

- Consistency with conventional accepted labels in TRIZ. Orloff appears to enjoy re-naming things:
 - Altshuller's "Forty Principles" become Orloff's "Specialized A-Navigators".
 - Altshuller's "Separation Principles" becomes, "Fundamental Transformations".
 - "Ideality", or "Ideal Final Result" seems to become Orloff's "Functional Ideal Model" (though he does refer to the model as resembling Ideal Final Result without defining it). While Ideality sneaks in several times, it isn't really defined until Chapter 9. It would really have helped if he introduced Ideality early with both the Ideal Final Result and the Functional Ideal Model clearly defined and distinguished from one another.
 - Orloff's re-naming of familiar terms would perhaps be acceptable for first-time visitors to TRIZ, but it will confuse them when they discover that all the rest of the TRIZ world continues to use a fairly consistent translation of Altshuller's vocabulary.
- Better internal referencing. On page 56, he refers to complex navigators 5.3.1 (S2) several times, and it is not clear where these can be identified by these numbers. Perhaps it is in Appendix 2, but they are hard to connect to the example if this is the case. Perhaps it is in Appendix 6, section 4.1, Phase Transition. (This was the one referred to, but finding it in context was difficult.
- An index. This is especially important for a book which keeps introducing new terms for previously known concepts.
- Less "leap-frog" introduction of concepts. (A concept is discussed, and maybe employed prior to its being defined or introduced). "Complex Navigators" were never defined in text. In Appendix 2, they were called "A-Compact -Standards"
- The Appendix area, particularly 8 - Physical Effects, 9 - Chemical Effects, and 10 - Geometric Effects all need examples. Naming an effect, such as the Bauschinger Effect, does nothing to tell me how it might even be applicable to my problem. People don't generally want to go running around looking up every effect in physics and chemistry to find out if they are applicable to their problem.
- Clarified introduction to contradictions. In his meta-TRIZ example, his first two contradictions (we clean the shooting range of broken clay pigeons vs. high effort) and (the shooting ground is cluttered vs. no effort) don't really feel like contradictions as phrased. Rephrasing would help: we want the field clean, but we don't want to invest the effort.
- Earlier use of illustrations with new concepts. His first example of using the 40 principles could have used either an illustration, or a bit more explanation, assuming this book is written for people new to TRIZ.
- Occasional repetition of definitions of abbreviations such as FIM. It took me a long time to get used to all his (new to me) abbreviations, and I found myself

checking back frequently to recall what they meant. This interrupts the logical thought processes.

- Include all the abbreviations in the Glossary: TWM, TC, etc.
- Include all of Altshuller's thinking about S-curve analysis including degree of innovation at each stage of the S-curve, and numbers of patents at each stage. This is another of Altshuller's contributions which has been validated repeatedly, and has proved valuable in deciding just where a particular technology is in its growth curve, and what sort of changes that technology is ready for with its next advance.

Finally, the author reviews some of the most prominent software tools and TRIZ practice in the world, mentioning Boris Zlotin and his works and outstanding Invention Machine as the leading. The author introduce along his own co-developed tools which combines several creativity techniques with TRIZ. Coincidentally and unnoticed, the writer of this review uses normally de Bono's techniques when applying ARIZ to different problems.

This review cannot be finished without citing a quotation of Altshuller in the book, which reflects the knowledgeable and thoughtful position of the author: “ *...TRIZ increases the available creative tool-box with dozens of procedures that, taken as a whole, offer a rational scheme for solutions to problems. But, a targeted search in no way excludes intuition. Quite the contrary: orderly thinking creates an atmosphere that stimulates moments of intuition.*” As the reviewers have seen, none of TRIZ tools or its developments give you the final solution. In a 100 meter race, ARIZ takes you 90 meters forward, but you still have to run the hardest last 10 meters to the finish: your good solution. Overall, in spite of all these recommendations for improvements, we like this book. With a lot of practice, a beginner could learn TRIZ from it, although it would be a lot easier with an experienced mentor. We would be inclined to use this as a text for teaching TRIZ. We would say go ahead and buy the book, as it is useful now, but we can't wait until the second edition appears!