

TRIZ For Everyone (Even Those Who Don't Want To Spend A Year Learning It)

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Introduction

Different people use TRIZ in different ways. This article builds on discussions begun at the TRIZ Future 2001 conference in Bath, and is about trying to find a common ground and understanding between the people describing themselves as having the 'TRIZ virus', and those who don't have the time, will or desire to invest a lot of time learning the tremendous amount of available richness.

We explore the possibilities of structuring TRIZ so that it can accommodate a full spectrum of user types and capabilities, and also some of the consequent implications for TRIZ educators.

Another Way of Looking at TRIZ

Is TRIZ a set of tools? A method? A way of thinking? A philosophy? Answer; all of the above. Figure 1 illustrates a hierarchical perspective of what this thing called TRIZ is.

At its very highest level, TRIZ may be seen as the systematic study of excellence. This study was initially focused on patents (a very good source of excellence for the most part), and then evolved to look at excellence in the sciences, and latterly, the arts, business, social sciences and politics.

Five key philosophical elements have emerged from this study. In no particular order, these are **Ideality** - and the concept of systems evolving to increasing good, decreasing bad - **Resources** - and the concept of maximizing the effectiveness of things inside and around a system (even the bad things) - **Space/Time** - and the importance of viewing systems in terms of their space and time context - **Functionality** - and the over-riding importance of function when thinking about systems - and **Contradictions** - and the concept of contradiction elimination as a primary evolution driver. Some of these are unique to TRIZ; some have parallel precedent within other similar studies of creativity.

At the bottom of the TRIZ hierarchy, then, are a wide-ranging and comprehensive series of tools and techniques. The tools contain a great deal - some might say overwhelming - level of richness, and to all intents and purposes, it may be said that there is a tool for practically any problem that may be encountered.

In between philosophy and this collection of tools is something we might loosely describe as 'method'. In actual fact, several methods - with just about every TRIZ provider presenting their own version of a method to string the tools together in whatever fashion they think most appropriate. It is at this level that many of the problems of TRIZ occur. Quite literally the choice

and quantity of available advice is overwhelming for the large majority of people encountering TRIZ.

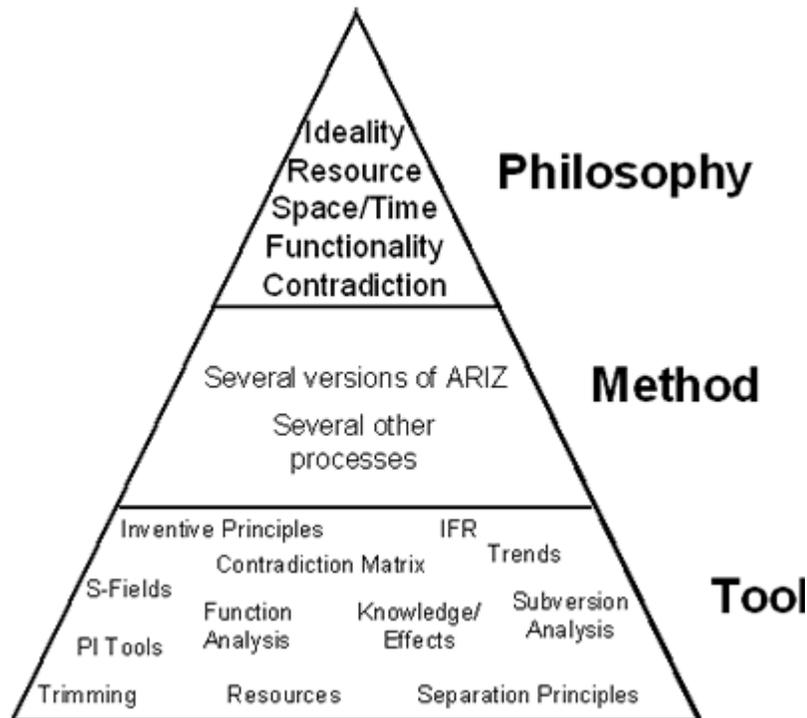


Figure 1: Hierarchical View of TRIZ

The essence of philosophy is distillation of large quantities of knowledge and experience into a small entity. It might take users a considerable amount of time to appreciate the significance of the five philosophical strands of TRIZ, but they can at least be remembered in a few minutes.

At the other end of the hierarchy pyramid, the TRIZ toolkit contains a series of tools that, to varying degrees can be learned and applied also in a relatively short space of time. There is a deal of variation, but as an average, a half-day of learning and doing is usually enough to give a newcomer the will, confidence and ability to use a given tool.

In between toolkit and philosophy, the learning curve for any of the TRIZ methods and processes (with or without software 'support') is probably measurable in weeks.

'Weeks' unfortunately is then at the heart of a big problem for the large majority of newcomers to TRIZ. A week is a serious investment of time for anyone in these busy times; there is simply too much else needing to be done, and not enough time to do it.

Does this mean we should give up? Or does it mean that it might be better to think about alternative ways of presenting and delivering TRIZ?

This author believes it is the latter.

Different User Profiles

Figure 2 illustrates a graph compiled from the experiences of watching several hundred students, engineers, scientists, strategists and managers go through at least two-days worth of TRIZ 'training'. (Admittedly two days is not a lot in a TRIZ learning context - but it is a fair approximation of the sort of course it is possible to sell.)

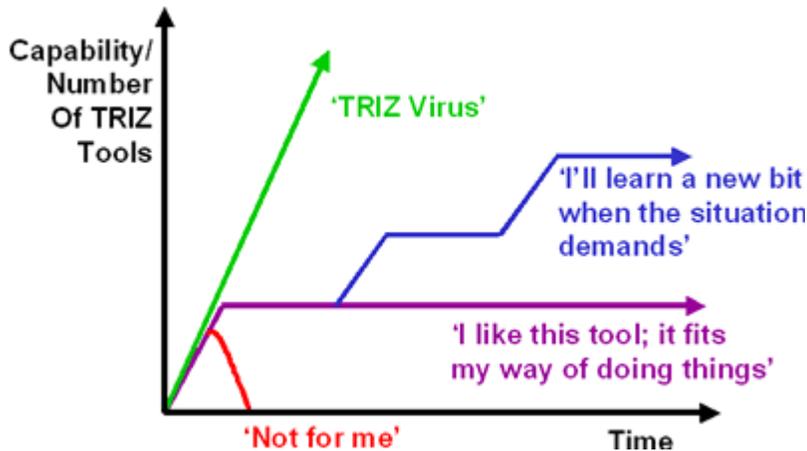


Figure 2: Typical TRIZ User Profiles

The first category of user types is the 'not for me' variety. This is the individual who, for whatever reason (with bad teaching and instinctive aversion because people have been instructed to attend by their boss being probably the top two reasons), decides they do not like TRIZ or do not want to commit the time necessary to learn it.

The second category involves those who discover a part of TRIZ that they like and chose to adopt it into their way of doing things. This 'part' might be a tool like the Contradiction Matrix or the Trends of Evolution, or it might simply be one or two of the Inventive Principles. At the end of the experience, the user has achieved some success using the particular tool or element of, is 'satisfied' by that success, and shows no desire to expand their TRIZ knowledge. In some small way, however, this category of user has been changed by their TRIZ experience.

The third category of user might be seen as the pragmatist. They usually start as users of the second category, but find that there are certain types of problem - or more usually a specific problem - that the TRIZ tool they know has failed to solve. They therefore look at other elements of TRIZ (or beyond) until they find something that does solve the problem. The success with the new tool then prompts the incorporation of that tool into that persons 'way of doing things'. (The importance of 'success' in determining whether someone picks up a part of TRIZ or not cannot be under-estimated.)

The fourth category of user profile is what is commonly described amongst long-time TRIZ users as 'having the virus' or 'being infected'. This type of user typically reads all of the books, papers and articles they can find on TRIZ, and sees TRIZ change a large part of their life.

Statistics can be used to show anything, and this author's data set is not as large as others, but approximations can nevertheless be very telling. A breakdown of how people are distributed between the four different categories is suggested in Figure 3. These figures might have an accuracy of ± 10 or more percent. Even with that level of inaccuracy, I think they contain some very important messages for user and provider alike. We will discuss four.

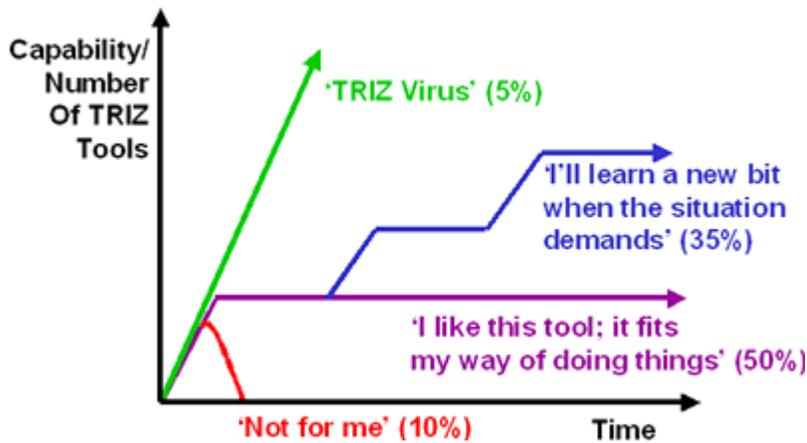


Figure 3: Typical TRIZ User Profiles With Approximate Percentages

The Folly of 'I Am Right; You Are Wrong'

Everyone has their own way of doing things. Some of these ways are demonstrably more effective than others, but nevertheless those embedded ways are present and they are constraints that will dictate how much and which parts of TRIZ people will be attracted to and which they will reject. There have been several questions in TRIZ discussion forums along the lines 'which are the most important parts of TRIZ?' The simple answer to the question is that it depends. It depends on the circumstances of the problem or opportunity under consideration, it depends on the user, and it depends on how TRIZ is delivered to them.

Given this belief, it is perhaps surprising that so many in the TRIZ community insist that their way of doing things is the right way. In simple terms, in each case, while it might be 'right' for them personally, it might be the complete opposite of right to someone else. So, to take a particular example, certain versions of ARIZ place the Psychological Inertia tools before Physical Contradiction separation methods, while others reverse the sequence. Which is right? Answer; both and neither. It depends.

To take a cooking analogy; there are definitely right and wrong ways of using the various tools contained in the kitchen. There is a right and a wrong way of holding a whisk, in the same way that once I have picked the whisk up by the handle instead of the blades, there is then a considerable degree of flexibility in how I can use the tool to achieve the desired function; I can stir clockwise or anti-clockwise, with or without a vertical component of motion, I can stop and start, I can change speed, I can change direction, I can do pretty much anything so long as the whisk is in the product and moving it.

At a higher level, I can then use a recipe to help me sequence ingredients and the things I do to them in order to eventually get me to a finished product. If I am trying to make soup, I could probably find several hundred recipes to help me do it. Some will say put the stock in first, and some will say don't. Assuming that the different authors are all trying to help me make soup that is edible, we can probably safely assume that each of them has created a recipe that will work. Some recipes will produce better (to me!) soup than others, but they will all provide me an output that looks and functions like soup.

The point? For users - find something that fits your way of doing things (whether it be one Inventive Principle or a complete problem solving method/recipe). For providers - think carefully before you tell people that your way of doing things is 'the right way'. You can probably guarantee that it is not.

Self-Adapting Systems

The folly of 'I am right; you are wrong' (see Reference 2 if you want more information on the subject) is somewhat paradoxical given the importance of identifying and eliminating contradictions within TRIZ. So is it psychological inertia tools before or after contradictions in ARIZ? Or would the smart solution be either? Or neither? Perhaps it would be useful to see it as a physical contradiction separable on condition. Psychological inertia tools before contradictions IF that's what I prefer; contradictions before psychological inertia tools IF I don't.

A large proportion of users will only ever know and use one or two tools of TRIZ. Reference 3 suggests the importance of 'self' in the drive towards increased ideality; self-adjusting, self-organising, etc, and any system that works out 'for itself' what is right are all good solution directions. If TRIZ is about encouraging people to think, perhaps a useful goal would be to offer them a structure that allows them to - as much as is feasibly practical - mix and match tools (both within and beyond TRIZ) to suit their particular individual circumstances. In other words, that they are able to adapt what tools and methods they use, how and when they use them to suit themSELVEs.

If I choose to ignore a recipe that is my decision. If I'm making soup it doesn't matter-I may get a thin soup or a thick one or even a stew, but it will be edible. If I'm making bread, and stray too far from the recipe, I will end up with something that isn't bread, and might not even be edible, or I might end up with something exciting and new. The former is usually more likely than the latter however, so in future, I might be well advised to follow some form of structure. I also know that I have my own tastes and that if I take a bit of this recipe and add a bit of that and then add this bit of my own, then I will end up with my ideal bread. 'My' being the important word.

If we ask ourselves the question is it better for me to adapt to TRIZ or for TRIZ to adapt to me, I think for the most part, many of us (especially those working in a time-constrained environment) would choose the latter.

Mastery

The profiles illustrated in Figure 2 bear some striking similarities to the profiles described in G Leonard's book 'Mastery' (Reference 1). The book describes the four broad categories as 'dabblers', 'hackers', 'masters' and 'obsessives' respectively. The book makes two points that have particular relevance to the latter two categories:

The first is that the third profile in the figure - the 'I'll learn a new bit when I need it' category - is the most effective route to 'mastery' of a subject. The book makes the point that the time gap between picking up successive new capabilities (i.e. the flat parts on the graph) is an important part of the knowledge acquisition process. The gap is useful because it provides an opportunity for consolidation; it allows the brain to fully embrace the new capability. In many senses it emphasizes the importance of a learning-doing cycle as a fundamental necessity in 'mastering' anything new.

The second interesting point made by the book involves the 'TRIZ virus' or 'obsessive' profile. The book actually draws a different characteristic profile of the 'obsessive' character. It looks something like the picture illustrated in Figure 4.

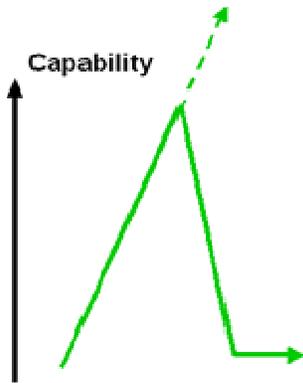


Figure 4: Propensity to 'Burn-Out' In Obsessives

In other words, there is a very strong correlation between obsessive drive towards a goal and burn-out. The characteristic is reported to be particularly common in situations where individuals pursue singular or non-diverse pursuit of a particular tool or method.

Overlap

Some (many?) people complain or are concerned that TRIZ appears to contain a considerable amount of overlap. This overlap exists between different tools, but it also exists within the same tool - note for example how much overlap exists in amongst just the Inventive Principles.

The response of some people to this overlap - particularly among TRIZ providers - is to eliminate it. This is perhaps understandable given that the overlap can become frustrating after a few years of using TRIZ.

On the other hand, what about the 50% of people that will only ever learn one part of TRIZ? Or the next 35% who will expand their knowledge only after what might be a considerable period of time? Is the overlap useful to them or not? Two answers; firstly as they are not aware of the bigger picture they are unlikely to be aware of any overlap and so it cannot harm or frustrate them. Secondly, if they are using TRIZ to try and solve a problem - or, in other words, 'achieve a benefit', the existence of overlap means that they are more likely to reach a solution. The point is made again in Figure 5.

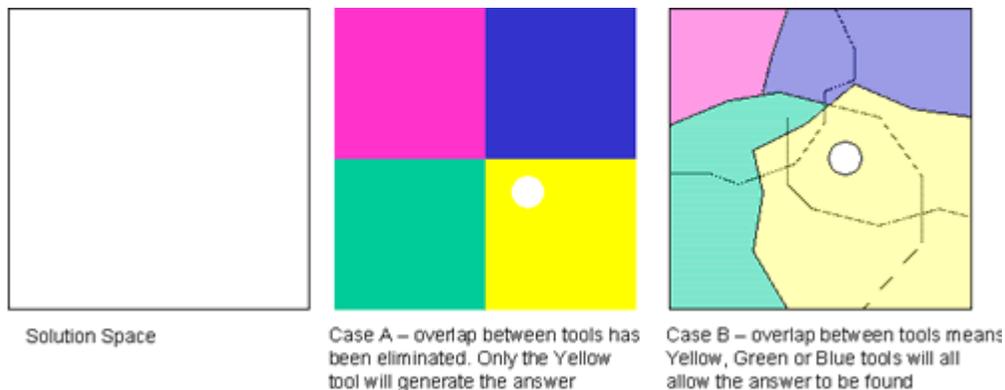


Figure 5: The Overlap Advantage - in Case A, if the user doesn't know the relevant tool they will not solve the problem. In case B, they have several opportunities to reach a successful solution.

Final Thought

There are generally believed to be two basic ways of achieving a goal. The first involves having a clear vision of what the goal is and an absolute determination to achieve it no matter what the obstacles are. The second involves having a clear vision of what the goal is, and an absolute determination to maximize the use of available resources to help reach the goal. The first might be called 'brute force'; the second 'harnessing natural forces'. Both can succeed. One route is harder work than the other.

The same choice exists when thinking about the spread and use of TRIZ. We can bludgeon people until they submit, or we can recognize that everyone is different, learns in different ways and wants different things. We can force them to do it our way, or allow them sufficient slack to adapt TRIZ (and indeed other tools, methods, and philosophies) to suit their particular differences. One is more likely to succeed than the other. One is harder work than the other.

References

1. Leonard, G., 'Mastery: The Keys To Success and Long-Term Fulfillment', Plume Books, 1992.
2. De Bono, E., 'I Am Right; You Are Wrong', Penguin Books, 1991.
3. Mann, D.L., 'Ideality And Self', paper presented at TRIZ Future 2001 conference, Bath, November 2001.

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