

## COMPARATIVE STUDY OF METHODS – Part Five

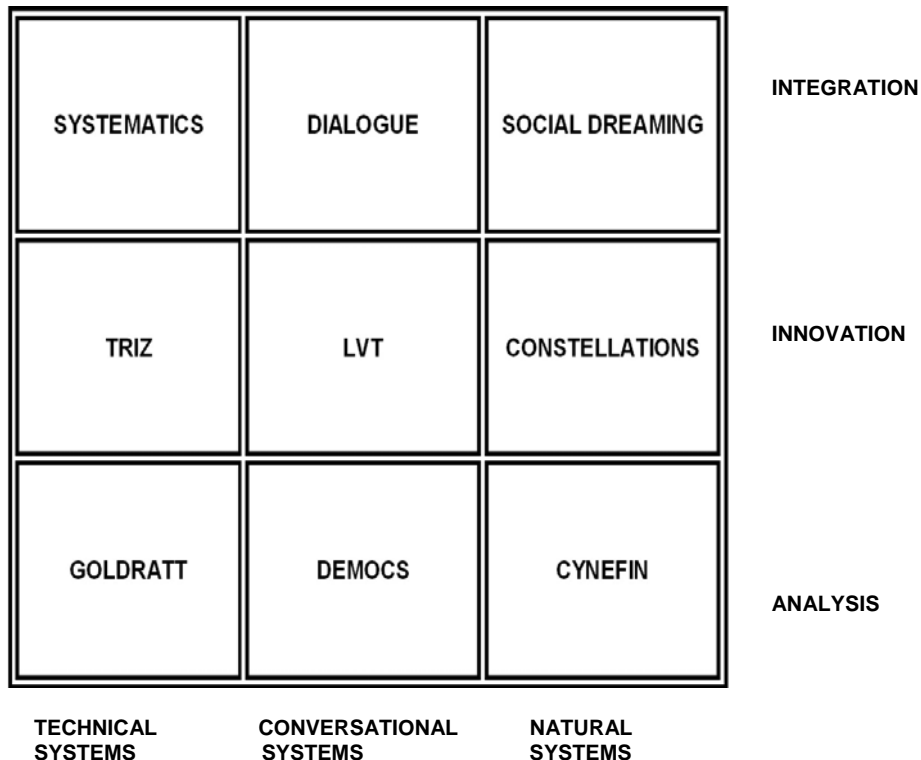
### TRIZ AND LVT

We have situated TRIZ at the intersection of Technical and Innovation. LVT is at the intersection of Conversational and Innovation. TRIZ is one of the four other methodologies that abut LVT and is therefore more closely related to it than the other group of four methods (such as Goldratt). There are some features of TRIZ that shed light on LVT, in particular the concept of *Ideality* as discussed below.

Since first writing this comparison more than a year ago, much has developed in our understanding of LVT and so we have attempted an update here.

TRIZ is also developing and there are now many versions of it to be found. One of the main things to note is that the more psychological and imaginative approach of the Russians (who involved practitioners in science fiction for example) has been pushed into the background in the west. In its place has come use of such popular schemes as those of Edward de Bono and his lateral thinking, etc. It is important to keep in mind the dual requirement of technical precision and imaginative freedom.

It is important to restate one of the main principles guiding this comparative study: *a system or method is incapable of evolving entirely from itself, but requires coupling with other systems or methods to do so.*



## TRIZ

TRIZ was originated by the Russian Genrich S. Altshuller (1926-1998) more than fifty years ago. The acronym stands for 'theory of inventive problem solving' (in Russian). Altshuller considered that merely 'psychological' approaches to solving problems and making innovations were inherently limited by *mental inertia*: just told 'to think' most people will simply repeat the same thoughts that have arisen from their limited range of experience. He also regarded techniques such as 'brainstorming' to be limited because they were too random and failed to draw on an *intelligent data-base*. He studied more than 200,000 patents to elicit 40 *principles of innovation*, concluding that these accounted for all cases. From this starting point, he went on to investigate fundamental patterns of innovation that could serve as intelligent guiding principles. Here is a summary of the essential features of TRIZ, but there are (see Darell Mann's comments below) different versions:

Recognition that technical systems evolve  
towards the increase of ideality  
by overcoming contradictions  
mostly with minimal introduction of resources.

Thus, for creative problem solving,  
TRIZ provides a dialectic way of thinking, i.e.,  
to understand the problem as a system,  
to image the ideal solution first, and  
to solve contradictions.

According to <http://www.triz-journal.com/archives/2001/06/d/index.htm>, TRIZ has the following three aspects:

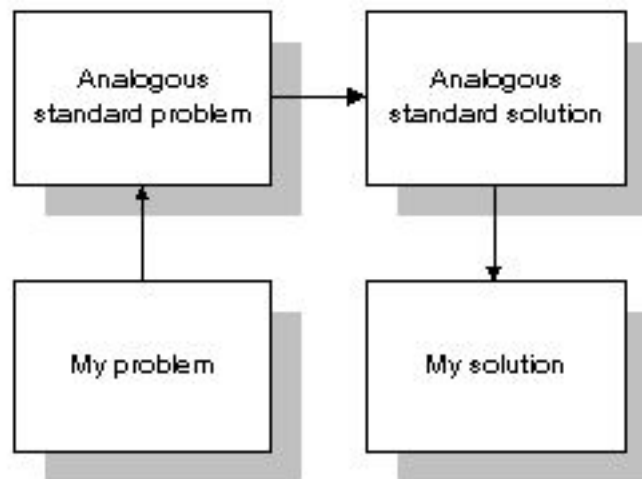
- **Methodology (a)**: New view of technology
- **Methodology (b)**: Thinking way for problem solving
- **Knowledge Base**: A collection of examples implementing the methodology (a)

The new view of technology saw it as an *evolving* complex. There were knowable trends, all of which could be summed up as evolution towards increasing *Ideality*, the measure of which was  $I = \text{sum of benefits} / \text{sum of costs and harm}$ . Evolution was driven by the arising and resolution of *contradictions*. A typical contradiction would be that increasing the power in a system meant an increase in the weight, consumption of energy and pollution of the system. In greater Ideality, power could increase without added costs and harm, and even a reduction in them.

The 'line' through contradiction to Ideality defines the direction of evolution. The concept of Ideality provides a picture of what to aim for, while the realization of the core contradiction provides the starting point.

A large number of tools have been developed to assist the process, which are all codifications of best practice. In particular, there are tables which enable people to relate classes of contradiction with sub-sets of the 40 principles, thus helping them focus on the most likely avenues of solution.

The method depends on understanding the given situation (device, problem, etc.) as a *system*. It is as a system that we can 'translate' one situation into another and use analogies to solve problems.



The critical step is to render the problem into systemic terms, thus representing it as a 'standard analogous problem'. This requires gathering of relevant data (Substance-Field Analysis *Su-Field* - Models a problem into three components for breakthrough thinking with regard to system structure and energy sources) and interpretation of relationships between components or sub-systems of the system. The analysis should reveal the critical conflict – one aspect of the system 'fighting' with another aspect. It should also reveal untapped resources – features of the system that have been considered as mere by-products or waste that can be used to move towards Ideality.

### General Parallels of TRIZ with LVT

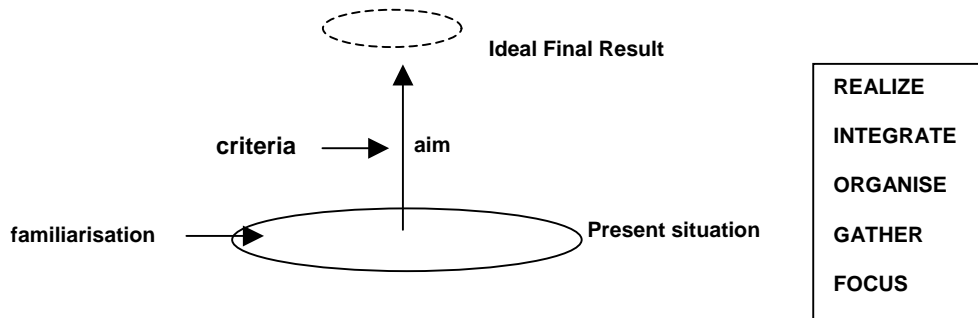
In both methods, there is a *central axis or direction* along which the work progresses. This line starts in the given situation and ends in something like an Ideal Final Result (IFR). In ordinary words, it ends in a 'better future'.

LVT has five stages, which begin with Focus. In Focus, there are two lines of work:

1. Familiarisation. This is often taken for granted. It entails getting people onto the same playing field and generating awareness of the given situation they have to deal with through their co-operation.
2. Formulation. This means, of the *aim*, usually as a question. In this process, the people have first to look towards a 'better future' or Ideality. Afterwards, they will be required to make an *imaginative* leap to put themselves into that future, with *its* perspective. To evaluate and improve the aim, a group can use *criteria* such as:

It is not what we would do anyway  
It has value and meaning  
It maximizes pay-off for effort  
It addresses many problems at once  
It will develop us  
It will have long term effects  
It can be done in terms of what we know and have now.

Such criteria can be provided as standard options or be generated by participants. They can be seen as reflections of Ideality but also as indications of contradiction.



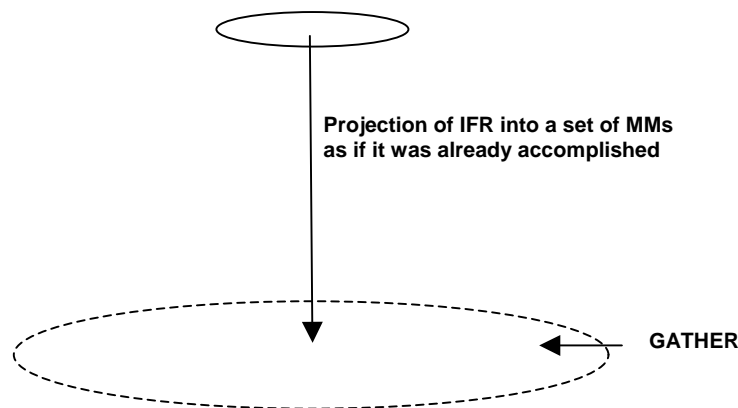
The key guiding question relates to what the IFR looks or even 'feels' like. The *psychological* benefit of this is that it helps people get out of their present focus on what may turn out to be misleading perceptions of 'problems'.

The next stages can be designed in various ways. A key step is in Organise. TRIZ provides significant *organizing ideas* such as the 40 inventive principles. LVT does not, but enables people to make their own. These will be on a lower level than the principles but immediately accessible because the people generate them.

The group can start (in Gather) and then organise what is available (present situation) from the perspective of the aim. In these terms, the clusters point to *hypotheses* about how the aim can be realised.

The stage of Integrate puts these hypotheses together into a coherent story that can relate to action. It is a move from tactics to strategy. It may involve awareness of contradiction.

In another approach, the stages can progressively articulate the IFR, starting from a Gathering of MMs of the type 'what would success look like?' This is an imaginative approach rather than an innovative one.



Many groups are not really concerned with innovation but with mutual understanding and clarification of what they want to achieve. It is usually the case that if a group of people understand what they want to achieve and have seen how each other think, then they can work out what to do to make it happen.

*The most important common feature* of LVT and TRIZ lies in their use of the human capacity to bring initially separate and known elements together to make something new; in LVT terms, to Gather, Organise, Integrate and Realize them in a new vision. LVT does this in a loose, soft way while TRIZ does this in a hard, technical way.

One of the basic principles of LVT is called deconstruct/construct (actually similar to one of the 40 principles of TRIZ). The LVT method is geared to 'fission' into MMs and 'fusion' into new types of MMs. There are many physical analogues such as nuclear transformations. LVT makes it easier for people to do this sort of thing, which enables *new meanings to be made from old ones*. It therefore addresses the basic process involved in TRIZ and other methods of innovation or creative problem solving without requiring any particular technique.

The practice of TRIZ requires the handling of a large amount of ideas or MMs. For this reason various devices such as tables and software have been developed. However, there is a place for considering the psychological context of innovation, which in particular requires people to (a) make analogies, and (b) see many MMs as one whole (with added value). For this reason, LVT offers a contribution because it (a) provides a means for handling a large number of MMs, and (b) it focuses very much on the perception of wholeness and 'form' – or system and/or design – particularly in the stage Integrate.

A most important aspect of TRIZ is its use of codified principles. These are principles of *meaning*. They rest on the understanding that there are common structural properties for diverse situations, which derives from the ability *to make meaningful analogies*. To date, no equivalent codification has been attempted in the realm of LVT.

LVT is primarily a 'bottom-up' method that begins with the raw elements of a situation and builds towards an insight into some ideal or 'natural' (see Hellinger) system of integration. People find synergic meaning amongst the raw elements, which are not just data but 'molecules of meaning' that people find relevant to their concerns. The way in which they find these new meanings is not explicitly addressed.

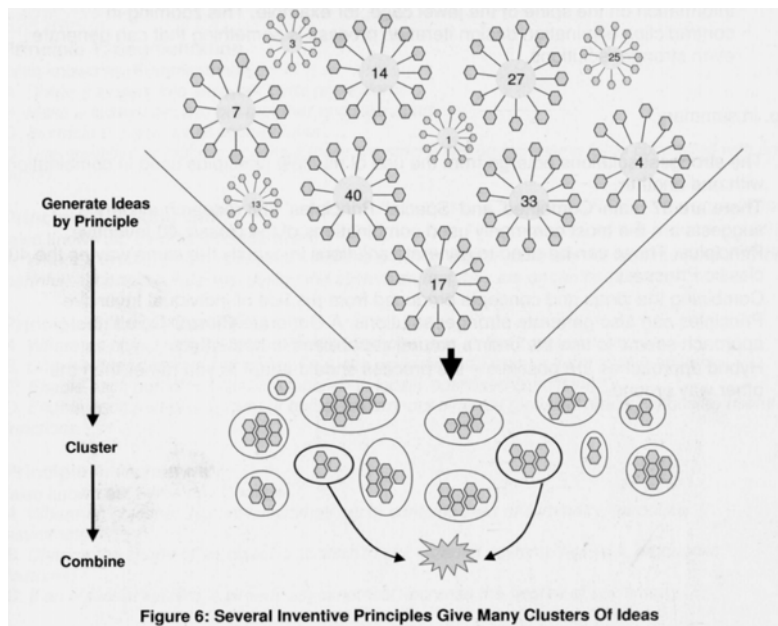
The issue of *contradiction* is important. LVT does not address contradiction and it operates only implicitly. As is nearly always the case, few people have the willingness to consciously embrace contradiction. Yet this awareness is the core organizing principle – as *the resolution of contradiction without compromise*.

The new LVT concept of Integration involving 'ring composition' is an attempt to address the resolution of contradiction without compromise (we do not have space to discuss this in detail). It is at this stage that it becomes possible for the group to become conscious of contradiction. So, in LVT, it is at the stage Integrate that dealing with contradiction appears, rather than, as in TRIZ right at the beginning.

TRIZ illuminates LVT while LVT offers ways of doing TRIZ. The two approaches can dovetail to some degree.

### **TRIZ and LVT – an example of joint method**

Darrell Mann, et al in *Matrix 2003* (pp. 113-9) describe a use of LVT for TRIZ. In this example, there were several contradictions and it was decided to explore all 40 inventive principles. For each principle, a set of MMs was produced that reflected a possible analogue of the principle in the given case. Because they were on magnetic hexagons, it was then possible to group them according to discerned mutual relevance (they would work together) and derive new MMs on another level. This was continued into further levels. The original 200 MMs were step by step coalesced into just a few, which then led to the final result.



At each stage of coalescence, knowledge about what would make the most fruitful combinations was brought into play. The 'molecular' approach of LVT enabled ideas to be examined one by one and then in meaningful combinations.

The final result in this case was predefined.

LVT has also been used by Darrell Mann to map out a problem situation in order to enable people to see where the key contradiction (in Goldratt, this is 'constraint') lies. A virtue of this approach is that people can be able and willing to articulate various aspects of a system, region by region, but not face up to the central issue. By engaging them in a mapping process, the various features can be combined to show the key contradiction for all involved in a neutral 'collective' way.

### Some Critical Comments from Darell Mann (as a response to the earlier version of the comparison and edited slightly)

- Definition of 'method' - your view of 'method' as having the two parts conflicts with my view. In my view 'method' has nothing to do with 'wisdom'. In my mental model, a method is a procedure that requires knowledge. Knowing when it is appropriate to use the method (i.e. 'context') is the thing that determines 'wisdom'. In other words 'wisdom' is operating at a meta-level. I've been using the equation  $\text{wisdom} = \text{knowledge} \times \text{context}$  for the last couple of years now; it still works for me. Method fits at the knowledge layer in my hierarchy model; context is at the philosophy level.
- You emphasise that TRIZ is a system for technical problems; which is correct historically, but misses the work being done at the moment on business and people applications (which, incidentally, advances a step further in the next edition of my Hands-On Business book with the integration of the (crucial) Spiral Dynamics).
- Your mention of S-Fields in the context of 'gathering data' is the first connection I've ever made to this role. Could you explain? The closest I could get is that we can use function analysis as a way of modelling a system – FA being a modern re-invention of S-Fields and a far more effective means of modelling what we think is happening.
- 'TRIZ has the following three aspects' – I'd have to say that this is a far from agreed view of TRIZ. Some distance from my own view as it happens.

See also as reference:

Mann, D. L., Dewulf, S., Zlotin, B, Zusnman, A., *Matrix 2003: Updating the TRIZ Contradiction Matrix*, CREAX Press, July 2003

Salamatov, Yuri: *TRIZ: The Right Solution at the Right Time, a guide to innovative problem solving*, Insytec B.V., Hattem, The Netherlands, 1999