

## SOMEONE, SOMEWHERE REALLY DID ALREADY INVENT THE WHEEL YOU'RE ABOUT TO RE-INVENT

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### **Abstract**

*Imagine the biggest study of human creativity ever conducted. Picture the systematic study of close to three million of the world's most successful patents, discoveries and business concept innovations. Picture, then, the construction of a problem solving method which then combines those solutions into a whole that strips away all boundaries between different industries and allows users to readily access the best practices of others. Now imagine that it exists. What you're seeing is TRIZ. The reason you may not have heard of it before, is that it was devised and developed in the former Soviet Union, and practically no one outside the Eastern Bloc had heard of it before the fall of the Berlin Wall. In this paper, we examine an evolved version of TRIZ and explore how it is helping users to systematically and reliably create breakthrough solutions to problems of all descriptions, without the re-inventing the wheel. A final section of the paper provides a pair of short case study examples to demonstrate the high probability that someone, somewhere has already solved your problem.*

### **Introduction**

TRIZ stands for *Teoriya Resheniya Izobreatatelskikh Zadatch*, which, translated into English, approximates to the Theory of Inventive Problem Solving. TRIZ research began in 1946 when engineer Genrich Altshuller was tasked with studying patents (Reference 1). TRIZ today represents the output of close to 2000 person years worth of research into not just patents, but successful problem solutions from all areas of human

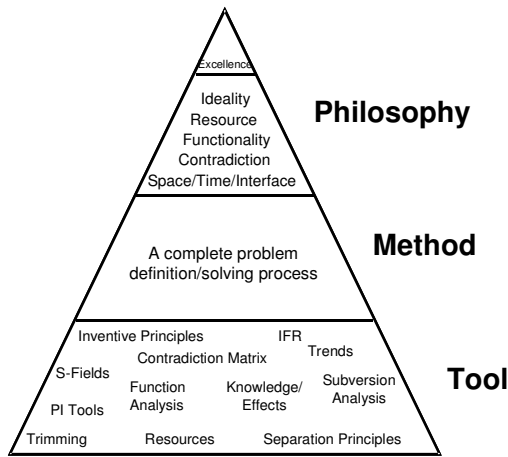
endeavour (Reference 2). The main findings of TRIZ are:-

1. That the same problems and solutions appear again and again across different industries, but that most organisations tend to re-invent the wheel rather than look outside their own experiences or the experiences of their direct competitors.
2. That the most powerful solutions are the ones that successfully eliminate the compromises and trade-offs conventionally viewed as inherent in systems.
3. That there are only a small number of possible strategies for overcoming such contradictions.
4. That the most powerful solutions also make maximum use of resources. Most organisations are highly inclined to solve problems by adding things rather than making the current things work more effectively, or transforming the things viewed as harmful into something useful.
5. That technology evolution trends follow highly predictable paths.

TRIZ was barely visible outside the Soviet Union until the fall of the Iron Curtain. Since then, the spread of the method has been relatively slow, thanks to a combination of language and cultural mismatches and the reluctance of organisations using TRIZ to describe their successes (and failures) to others.

TRIZ works on several levels – Figure 1 – firstly a collection of tools, secondly a complete process that links different tools together for any given innovation situation,

and thirdly a series of philosophical ideas. In the first section, the paper focuses on TRIZ at its highest level – the distillation of excellence – and shows how this idea has now seen the extension of TRIZ boundaries into other methodologies and strategies. The second section of the paper then details the main philosophical pillars emerging from this distillation of excellence to form the basis of the evolved TRIZ. The third section then outlines a pair of simplified case studies in which the basic tools are used to solve a series of typical problems.



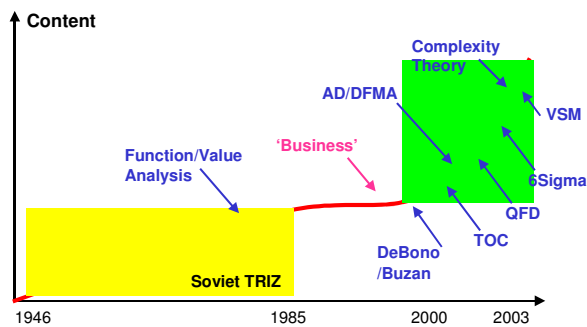
**Figure 1: Tool, Method & Philosophical Levels of TRIZ**

**Extending The Boundaries**

The original TRIZ research focused on the distillation of excellence primarily as it existed in the global patent database. Not everyone patents their good ideas of course, and so over time the knowledge search space has gradually expanded to encompass the sciences, manufacturing processes, psychology and, latterly, business (Reference 3). During the research to incorporate the best practices of business into the TRIZ framework, the knowledge search space has further expanded to include other tools and methods – Figure 2.

The basic idea behind this broadening of scope has been the recognition that there is considerable convergence between different problem solving tools and techniques, and that the ‘someone, somewhere already solved your problem’ concept applies equally well to the evolution of those other methods. So, for example, if a user finds that they are having a problem with applying a certain tool in a

certain specific situation, then according to TRIZ, someone, somewhere is highly likely to have found a solution to that problem.



**Figure 2: Evolution Beyond ‘Classical’ TRIZ**

One of the key outcomes from this evolved version of TRIZ is what is hoped to be at least the foundation of a global knowledge framework. An ongoing process of integration between different tools and methods (Reference 4) is seeking to understand and resolve conflicts that may be seen to exist between different tools – the key underlying assumption here being that if two methods are seen to produce useful outcomes, but are inconsistent with each other, then the inconsistency needs to be resolved in a manner which maintains the validity of both. Perhaps interesting to note from Figure 2 is that the link between TRIZ and value analysis goes back many years: The work of Larry Miles (Reference 5) first found its way (in evolved form – Reference 6) back in the 1970s.

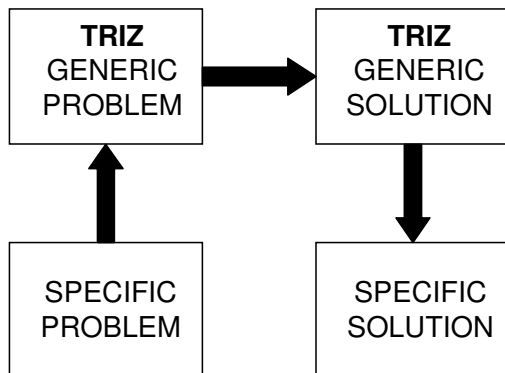
Assuming that a ‘global knowledge framework’ can be constructed (of course, such a framework will always need the flexibility to evolve as new knowledge emerges), the next question concerns how users might access the knowledge that is relevant to them. If someone, somewhere really has already invented the wheel you are about to re-invent, in other words, how can we find what has already been done? On our way to answering this question, we need to first examine some of the philosophical pillars of the evolved TRIZ method in order to gain a feel for the architecture of the knowledge framework:

**Philosophy of the evolved TRIZ**

**– Five Pillars**

To some people the idea that someone, somewhere has already solved their problem might sound quite threatening. This is particularly so if, for example, we are a leader in our particular discipline and have been working on a problem for a long period of time. TRIZ recognises that a world expert in their field is exactly that. It also recognises that being an expert in a field is a full-time job. Few if any experts in one field have the time to become familiar with other fields. This, then, is where TRIZ hopefully becomes an opportunity rather than a threat. TRIZ research uncovered the fact that very different industries are all solving very similar problems, and that by constructing an appropriate framework for knowledge it makes it possible to systematically bridge the gaps that traditionally exist between different the industries and sciences. The expert, therefore, is offered the opportunity to see how experts in other fields have solved similar problems. Even if, at first sight, those problems do not appear to be the same.

In both directions, TRIZ provides means for problem solvers to access the good solutions obtained by the world's finest inventive minds. The basic process by which this occurs is illustrated in Figure 3. Essentially, TRIZ researchers have attempted to encapsulate the principles of good inventive practice and set them into a globally generic problem-solving framework. The task of problem definers and problem solvers using the large majority of the TRIZ tools thus becomes one in which they have to map their specific problems and solutions to and from this generic framework.



**Figure 3: The Basic TRIZ Problem Solving Process**

Beyond this big idea of distilling all knowledge into a common framework, there are then five central philosophies underpinning the method. TRIZ can be used without knowledge of these pillars, and indeed many users are happy to simply take one or two tools from the toolkit. Nevertheless, appreciation of these big ideas undoubtedly increases the likelihood that TRIZ will deliver significant tangible benefit. The pillars are described in no particular order below:

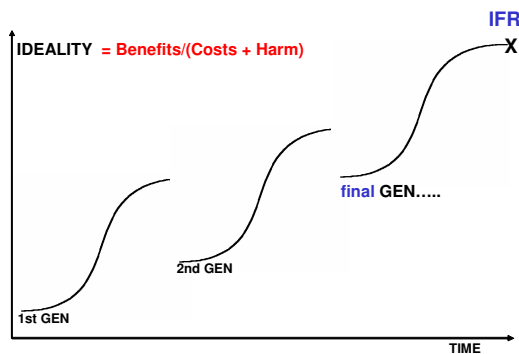
**Ideality**

Ideality is in many ways similar to the concept of 'value' already familiar to those working in the value analysis arena. Ideality is defined as the sum of the benefits that a system delivers to its user divided by the sum of the cost of delivering those benefits and the any other negative side effects that may occur (waste, waiting time, environmental damage, etc). The TRIZ researchers identified a very simple phenomenon common to all successful innovations – that they all delivered a higher level of ideality than the products and processes that preceded them. Hopefully the idea that we should give customers more good things and less bad if we are going to be successful is not a great surprise. It does mean, however, that there is a definable direction of success. More interesting than this idea of direction is the concept of a final destination. In TRIZ this final destination is known as the Ideal Final Result (IFR). The IFR is defined as that point when the customer gets all the benefits they want, without any of the costs or harms. The IFR is deliberately intended to take us far beyond the traditional value analysis world-view.

Related to this evolution towards the IFR (recognising that every customer will potentially have a different definition of the IFR of course) is the knowledge that systems evolve through a series of discontinuous jumps or s-curves. Figure 4 illustrates a fundamental dynamic governing the evolution of all systems – any individual system will improve up to a point where it is incapable of improving further, then, provided the customer is demanding further improvements, the only way forward is to make a discontinuous jump to another system. The evolution of systems towards the IFR destination may thus be seen as a series of discontinuous jumps. This

applies equally well to the evolution of methods. Value analysis itself, for example, is in many ways a science at the limits of its current form. Further evolution of the method is highly likely to require a discontinuous jump to another s-curve. Reference 5 again provides suggestions on what this jump might look like – based, of course, on the ‘someone, somewhere already invented your wheel’ idea.

The next key finding of TRIZ is that the steps denoting a shift from one S-curve to the next are highly predictable. This may sound difficult to believe, but the overwhelming evidence from the analysis of all of the successful solutions is that there are a number of patterns of discontinuous jumps that repeat faithfully across different industries. This paper does not set out to ‘prove’ that these trend patterns are correct, but instead merely asks the users to speculate on the impact that predictable evolution would have on their business and the way it thinks about its future relative to competitors.

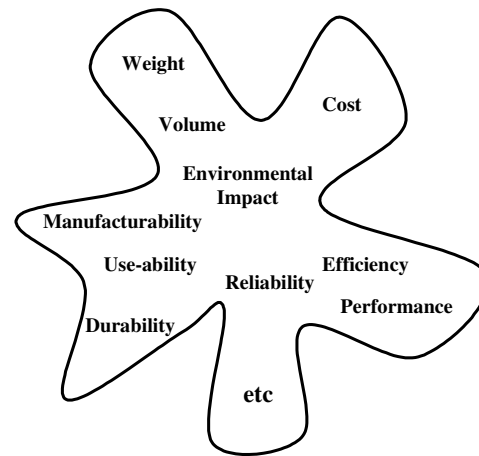


**Figure 4: The Fundamental Dynamics Of System Evolution**

**Contradictions**

Although often the first of the tools seen by newcomers to TRIZ, Contradictions is probably the tool that is deployed least well. At least part of the reason for this is that the main underlying principle of the Contradictions philosophy – that of seeking to identify and eliminate contradictions – is almost the complete opposite of traditional problem solving strategies. In nearly all problem-solving methodologies the emphasis is very firmly placed on the importance of achieving ‘optimum’ compromises between conflicting problem parameters. There is a strong tendency in a traditional design

approach, in fact, to think of the design process as an amorphous bag filled with an incompressible fluid made from the different design parameters – Figure 5 – in which, as the designer tries to squash the bag to improve one parameter, it bulges out somewhere else as a different parameter gets worse. According to TRIZ, every time we opt for the optimum solution, we have missed an opportunity to achieve the ideal solution.



**Figure 5: The Design Process As An Incompressible-Fluid Filled Bag**

The keen emphasis on ‘trade-off’ solutions in traditional problem solving practice often means that problem owners are rarely explicitly aware that conflicts exist. The first major part of the paradigm shift that takes place in the Contradictions part of TRIZ is the need for problem solvers to actively seek out the conflicts and contradictions inherent in all systems. The second part then involves using the TRIZ methodology to try and ‘eliminate’ those contradictions rather than to accept them. Or, in terms of the incompressible-fluid filled bag analogy, to attach a valve of some kind that allows the amount of fluid in the bag to be altered.

Once contradictions have been identified, TRIZ contains a number of ‘contradiction elimination’ tools – primarily the Contradiction Matrix (References 6 and, more recently, 7) – which encapsulate how others have successfully solved similar problems. At this point in time, TRIZ has identified 40 Inventive Principles which might apply in any given contradiction situation. The

Contradiction Matrix allows problem solvers to narrow down that list of 40 to a more manageable five or six Principles which might apply to an individual contradiction type. There may, of course, ultimately be more than 40 Principles. As of today, however, wherever researchers look, we see the same 40.

Contradiction elimination is one of the most powerful of the TRIZ problem solving tools. A common phenomenon when problem contradictions are eliminated instead of traded-off is that the benefits tend to extend beyond those initially targeted during the problem solving process (References 8, 9).

In terms of evolutionary S-curves, it is the emergence of limiting contradictions (Reference 10) that ultimately restrict the ability of systems to give all of the benefits that customers desire and give the S-curve its characteristic flattened profile at the mature end of the curve. The TRIZ contradiction elimination tools thus have a very important role to play in allowing systems to transition from one S-curve to another.

The Contradiction Matrix represents one of a number of knowledge repositories within the TRIZ framework. It is intended to act as one of the bridges that will allow a user to locate and deploy the contradiction-eliminating wheels already discovered by others. By way of demonstration of the breadth of this capability, consider for a moment the following problems:

- 1) How to reduce tyre-wear on large aeroplanes
- 2) How to increase computer data transmission integrity
- 3) How to prevent deposition on the container during electro-less plating operations
- 4) How to improve recovery of a catalyst following a chemical reaction
- 5) How do we improve knowledge retention in students when there is never enough time to teach everything?

According to TRIZ, each of these five problems is identical when examined through the lens provided by the Contradiction Matrix. Not only this, but when we examine the inventive strategies used in, say, each of the first four cases, we discover that they have all used exactly the same ones. What this means

is that, suddenly, if we find ourselves facing the fifth problem on the list, we can look to the first four problems – aerospace, ICT, manufacture and chemical – and access, in the abstracted form provided by the 40 Principles, the best of their solutions.

### Functionality

Although the functionality aspects of TRIZ owe a significant debt to the pioneering work on Value Engineering by Miles (Reference 5), the method of defining and using functionality data is markedly different; sufficient at the very least to merit discussion as a distinct paradigm shift in thinking relative to traditional occidental thought processes. Three aspects are worthy of particular note:-

- 1) The idea that a system possesses a Main Useful Function (MUF) and that any system component that does not contribute towards the achievement of this function is ultimately harmful. In a heat exchanger, for example, the MUF is to transfer heat to the working medium; everything else in the system is there solely because we don't yet know how to achieve the MUF without the support of the ancillary components. (Systems may of course perform several additional useful functions according to the requirements of the customer.)
- 2) In traditional function mapping, the emphasis is very much on the establishment of positive functional relationships between components. TRIZ places considerable emphasis on plotting both the positive and the negative relationships contained in a system, and, more importantly, on using the function analysis as a means of identifying the contradictions in a system.
- 3) Functionality is the common thread by which it becomes possible to share knowledge between widely differing industries. A motorcar is a specific solution to the generic function 'move people', just as a washing powder is a specific solution to the generic function 'remove object'. By classifying and arranging knowledge by function, it becomes possible for manufacturers of washing powder to examine how other

industries have achieved the same basic 'remove solid object' function. '*Solutions change, functions stay the same*' is a message which forms a central thread in the TRIZ methodology: People want a hole not a drill.

A number of functionally classified knowledge databases are now becoming commercially available. A free version is available at Reference 11.

### Use Of Resources

The fourth of the five philosophical pillars of TRIZ is the simplest, and relates to the unprecedented emphasis placed on the maximisation of use of everything contained within a system. In TRIZ terms, a resource is *anything in the system which is not being used to its maximum potential*. TRIZ demands an aggressive and seemingly relentless pursuit of things in (and around) a system which are not being used to their maximum potential. Discovery of such resources then reveals opportunities through which the design of a system may be improved.

In addition to this relentless pursuit of resources, TRIZ demands that the search for resources also take due account of negative as well as the traditionally positive resources in a system. In TRIZ terms, even the bad stuff is good stuff – we merely haven't thought hard enough yet about how to make the transformation from lemons to lemonade. By way of an example of this 'turning lemons into lemonade' concept, TRIZ practitioners often think of resonance as a resource. This is in direct contradiction to most practice, where resonance is commonly viewed as something to be avoided at all costs. TRIZ says that somewhere, somehow, resonance in a system can be used to beneficial effect. In effect, resonance is a potent force lever capable of amplifying small inputs into large outputs. Resonance is currently being used to generate beneficial effects in a number of new product developments from vacuum cleaners (resonating carpet fibres to enhance extraction of dust particles), paint stripping systems on ships (firing a pulsed jet of water – existing resource! – at the local resonant frequency of the hull), and in helping to empty trucks carrying powder-based substances more quickly. Again, someone, somewhere already

found a way of making positive use of the untapped resources in your system.

### Space, Time, Interface

The fifth pillar of TRIZ is about perspective on problems. Our perspective on a situation plays a very important role in determining the solutions we derive. It is therefore very important to be able to look at things from many different viewpoints – not only physically and temporally, but also the relationships and interfaces between the things can be as important as the things themselves. The human brain has not evolved to be creative. It has evolved to absorb sparse data and make decisions on that data. Sometimes – as in an emergency – this decision making process has to happen very quickly. As a result, the brain very quickly makes assumptions about what a problem is and what to do about it. Unfortunately, the brain very often jumps to what turns out to be the wrong definition of the situation. The space-time-interface pillar of TRIZ is about enabling users to systematically re-frame their thinking in order to avoid the problem of jumping to the wrong problem definition.

### A Simple Case Study

In order to give a flavour of TRIZ in action and to compare the TRIZ approach with that of traditional problem solving methods, this section of the paper examines a typical manufacture quality problem. The example relates to the extrusion of man-made textile fibres. In this operation we are trying to produce fibres of as small a diameter as possible in order to produce the highest possible appearance and feel in the finished textile. We are also trying to achieve 6 Sigma levels of quality (i.e. 3.4 failures per million opportunities) during the extrusion process, but unfortunately have not been able to do so despite considerable experimental effort. The main source of defects concerns fibre breakage due to localised 'necking' – lengths of the fibre that are lower than specified diameter. The start point for this situation then is our desire to improve the quality of the extrusion process by reducing the necking problem and hence reducing the number of fibre breakages.

Once we know what we would like to improve, the next question asked in a

simplified version of the TRIZ process would be 'what is stopping us from making the improvement?' The answer to this question may be that we don't know. If that is the case then TRIZ will tell us that we need to acquire some data in order to understand why in this case necking occurs. For most production processes the desire to optimise processes generally means that we will have a pretty good idea about what causes variation in the process. In the case of a typical extrusion operation quality is likely to be related to changes in temperature of the material, atmospheric temperature, size of the die, pumping pressure, tension on the fibre after extrusion, atmospheric pressure, humidity, etc. Let us then speculate that the reason for the presence of necking in the fibre is fluctuation in the temperature of the molten material before it enters the die. In traditional problem solving analysis, we might choose to explore this situation further by asking why the temperature fluctuations occur. Indeed we might take this a step further by experimenting with all of the other variables in the system to see how they might affect temperature and then necking. If we did this we might well determine that, for example, it was possible to reduce the temperature variation problem by slowing down the process (i.e. allowing more time for the temperature to stabilise throughout the material). With this finding we now have the potential of a solution to the problem; slowing the process down improves temperature distribution which in turn reduces breakages. While this might indeed solve the quality problem, the solution has been achieved at the expense of throughput. We have improved one thing only for another to get worse. If we determine that quality is more important than speed then we may be happy with this decision.

TRIZ on the other hand will tell us that we have now found a contradiction. Something gets better and something else gets worse. In the ideal case, we would find a way of improving the quality without reducing the speed. The contradictions part of the method contains a Contradiction Matrix tool (Reference 3). This tool enables users to see how other problem solvers have solved similar problems without making compromises. In the case of this hypothetical extrusion process, we have identified that there is a contradiction

between our desire for even temperature distribution and the lack of time for the heat to spread evenly through the material. According to TRIZ, someone, somewhere has already found ways of solving this problem. Figure 6 illustrates how the Matrix has been used to resolve the problem in other disciplines.

|  |  |    |    |    |    |   |
|--|--|----|----|----|----|---|
| Temperature (22)   | Duration of Action of Moving Object (12) | 19 | 15 | 13 | 39 | 1 |
| Even temperature distribution of the raw material is prevented by the limited time available for heating |  | 18 | 30 | 9  | 3  | 3 |

**Figure 6: The Temperature versus Time Contradiction And How Other People Have Solved It**

In this case we may see that 9 different Inventive Principles have been used to successfully resolve this type of temperature-versus-time conflict pair. Closer examination of the Inventive Principle descriptions (Reference 6) will then reveal several possible solution options:-

Principle 15, Dynamics – introduce some kind of a stirrer into the system to improve mixing of hot and cold materials.

Principle 19, Periodic Action – rather than adding a mechanical mixer, use pressure pulsations to improve mixing of the raw material.

Principle 1, Segmentation – instead of attempting to heat all of the raw material to the same temperature, recognise that the only time when temperature is important is when the material enters the die. Hence rather than seeking to accurately control the temperature of all of the material, segment the problem and only accurately control that material which is about to enter the die.

Principle 18, Vibration – here we might use some form of vibration (the Principle actually suggests the use of ultrasound) to improve mixing of the material and hence the removal of hot spots.

The only limits to the number of solutions that can be found will generally be dependent on the ability of the problem solver to interpret the Inventive Principles. With practice it is possible to still be generating viable no-trade-off solutions for several hours. Compare this with a typical brainstorming session where ideas generally run out after less than 20-30 minutes.

This quality problem study has been solved as a contradiction problem since – as with many

manufacture systems – there are highly likely to be contradictions present since we are always trying to get the maximum out of the system that we can. Asking the pair of questions ‘what would I like to improve?’ and ‘what stops me?’ is a simple and effective way of identifying these contradictions. An alternative problem strategy would have involved recognising that the problem has got something to do with the even heating of a liquid. Making this connection, the TRIZ function database would have suggested that, looking across every different industry, there are many ways of delivering this function. We could, for example, seek to deploy acoustic cavitation or the Joule-Lenz Effect or Ranque Effect or microwave, etc as other sectors wishing to perform the ‘heat liquid’ function have already discovered for me. If we have never heard of some of these methods of heating, the database at Reference 11 provides more information on each.

#### **A Case Study Using The Function Database**

We can take this idea of looking outside our own industry sector a step further by considering recent innovations in the clothes-cleaning business. We can also use this story as a way of making a direct connection to the concepts of ideality and value analysis.

We might start this case – as will often be the case – with consideration of the Ideal Final Result (IFR) concept. Deployment of IFR thinking begins with consideration of the benefits delivered to the customer. In this case, the function is ‘clean clothes’. In the IFR scenario, this function is delivered with zero cost or harm. A typical IFR solution often features the word ‘self’, and in this case we might imagine that if clothes could clean ‘themselves’ (or, equivalent definition in TRIZ terms, ‘didn’t get dirty’), then we would achieve what would in the eyes of many customers be an ideal solution since it would eliminate the need for washing machines, detergents and all the other elements typically present in a laundry situation.

According to the ‘someone, somewhere...’ message, we ought to find, then, that someone has already achieved such a ‘self-cleaning’ solution. In fact a short visit to an on-line patent database will quickly reveal that many

people have been thinking about such solution directions (usually not companies in the laundry business). It is often the case that if we can find someone who experiences a problem to a more extreme effect than you, then they are much more likely to have discovered a solution. In this case, we will quickly see that many systems in nature have had to solve the problem. We will also see that the military has devoted considerable resources to the problem – the logistical benefits of not having to worry about laundry, of course, makes the self-cleaning uniform a potentially significant tactical advantage.

Solving the laundry problem at this ‘IFR level will very typically lead us to either the self-x based patent database searches or analysis of solutions from the natural world – where efficient use of resources is a critical survival determinant.

We might at this stage decide that the constraints of our laundry problem dictate that the nature and military solutions are too far away into the future. If we do this, then the IFR tool in TRIZ recommends that we work backwards from the IFR definition to something that does meet our constraints. Typical steps back in this instance – depending on our perspective on the value-chain – might be achieving the ‘clean clothes’ function with no washing-machine, or not water, or no need for dry-cleaning chemicals or detergents.

For the sake of demonstration, let us explore the ‘no detergent’ problem definition. We could, of course, repeat exactly the same procedure for the other potential solution directions. Again, as soon as we have hypothesised a solution direction, the TRIZ assumption is that ‘someone, somewhere will already have been thinking about the problem. In this case, we can go directly to one of the TRIZ-based function databases and look up the function ‘clean’ to see how many other people have invented wheels in this area.

Figure 7 illustrates what we might expect to find in this list. Clearly, the world has uncovered a large array of different types of solution to the ‘clean’ problem. Our job at this point then becomes one of working through this list in order to identify whether any of the entries offer a higher value proposition than

our current detergent solution. If we can find one, then clearly we open up the opportunity (if we are the first to do so) to generate a piece of intellectual property that could potentially introduce a sharp discontinuity to a market.

- Desorption
- Acoustic cavitation
- Acoustic vibration
- Cavitation
- Jet erosion
- Electro-erosion
- Electron impact desorption
- Laser evaporation
- Ion beam
- Redox reactions
- Hydrodynamic cavitation
- Laser gettering
- Longitudinal ultrasonic oscillation
- Ultrasonics
- Friction
- Cryolysis
- Photo-oxidation
- Optohydraulic effect
- Electrical explosion
- Thermo-destruction
- Dissolution
- Electro-rheological effect
- Brushes
- Electrolysis

**Figure 7: Partial List Of Entries In The 'Clean' Category Of The TRIZ Function Database**

The recent introduction by Sanyo of a 'detergent-less' washing-machine based on ultrasound – one of the entries in the Figure 7 list – offers a vivid example of the kind of technology transfer made possible by this kind of TRIZ function database.

There are many other factors that will determine whether Sanyo get their overall customer value proposition right and make their ultrasonic machine a success. Other parts of the TRIZ toolkit – most likely the Contradiction tool in this case – exist to ensure that this happens. By asking what we would like to improve about the ultrasonic machine, and then what's stopping us, we identify a series of contradictions that will hopefully allow Sanyo to progressively create a more and more irresistible value proposition. A key idea in this regard is the idea of 'staying one contradiction ahead of the competition'.

The key issue at this point is that, whatever those next contradictions might turn out to be, someone, somewhere has already solved them too. And so the evolution story continues.

### Summary

To try and summarize and give a flavour of the world's biggest study of creativity and innovation in a mere ten pages is an almost impossible task. For anyone that wishes to explore TRIZ in more detail there is a wealth of available information on the subject. Much of this information is available for free on the Internet. See Reference 11, for example, for a collection of over 200 TRIZ websites. Despite the fact that TRIZ will tell us that the nuclear, aerospace, bio-sciences, micro-electronics, chemical process, automotive, food, education, politics, HR, logistics, etc sectors are all solving similar problems it is still very difficult to conceive the possibility that someone has already solved your problem. But that is indeed what the evidence of nearly three million analyses will tell us. As companies and individuals gradually become more willing to talk about what they are doing with TRIZ, it becomes increasingly likely to find something specifically connected with your situation.

The main success factor with TRIZ is to get some initial tangible benefit. To learn the whole of TRIZ will probably require an investment of three to six months of effort. No one is going to (or indeed ought to) make this level of commitment without some faith that the benefits will outweigh the costs. A very important final word, then, is that there is absolutely no need to learn the whole of TRIZ before users can start delivering real benefits. Many users will learn one tool only, and will stick with just that one tool. If that enables them to solve a problem or improve customer value or create a patent then a major service will have been provided. Then and only then should the inclination to learn other parts be encouraged. Let the use of TRIZ grow from the tangible benefits that it delivers.

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