



## Quality and Innovation: Friends or Foes?

Andrew Martin - Oxford Creativity

andrew.martin@triz.co.uk

Does Quality stifle Innovation? Does Innovation kill Quality?

As an advocate of the TRIZ Toolkit (which offers systematic innovation and problem solving) I was intrigued whether the TRIZ processes could be embedded into company systems in a similar way to quality processes. I then pondered whether the quality processes themselves needed TRIZ- hence this paper which discusses the tensions between the cultures of 'quality' and 'innovation'.

Is there an inherent contradiction between the two cultures?

Are they in opposition or harmony?

How can organisations work within a framework of a highly controlled and repeatable quality control system (typified by ISO 9000) whilst at the same time allowing and enabling a culture of innovation and creativity?

What challenges or opportunities arise from the relationship between them, and what should we do in response?

The paper argues that there is no inherent contradiction between quality and innovation. On the contrary, a highly controlled, systematic and regulated working environment can be used to support and enhance a culture of innovation. Instead of a creativity blocker, it can be a creativity enabler, leading to more innovation rather than less.

A good quality system will not merely leave a space in which creativity can happen - instead it will increase creativity and innovation through the use of systematic, repeatable and auditable processes.

Quality and Innovation need not be foes, but should be the most intimate of friends.

### Mission, Vision, Quality and Innovation

Most companies and other organisations have a mission statement, or something similar, perhaps supported by a vision statement or a sentence or two describing the organisation's values or ethos. These statements set out to proclaim the essence of what that the organisation is all about and (typically) summaries why the organisation exists, where it is going and how it will get there. It is likely that the organisation to which you belong has such a thing. A mission statement may be a source of pride, encouragement and inspiration or, perhaps, embarrassment, disdain and disbelief. Whether loved or loathed, the carefully chosen words of the mission statement provide a useful insight into what our organisations are, what they aspire to be and how they wish to be perceived by the rest of the world. Because the essence of the mission statement is brevity, clarity and relevance, and all but the most essential elements are ruthlessly excluded; the words that remain tell us much about what the organisation considers to be most important (or, more cynically, what the organisation imagines the intended audience will consider to be most important). By this criterion the values of 'quality' and 'innovation' are considered to be essential to the success of very many organisations.



Every ISO 9000 certified company is required to have an established quality policy. Every employee in such a company is required to know about the quality policy and understand it. This quality policy should include the company's mission statement (or equivalent) and will proscribe the use of specific processes for achieving that mission. Employees of an ISO9000 certified organisation are expected to be able to describe the quality policy in their own words and be familiar with the actions that allow the company to achieve that policy.

Thus for many organisations there is a formal obligation to achieve both Quality and Innovation.

For the purposes of this discussion we define a '*Quality System*' as the system of process designed to improve and control quality of the products or services provided by a company or organisation. A Quality System typically includes a set of procedures that define the processes used by the organisation, including procedures for measuring adherence to the quality system as well as the quality of the outputs for the processes.

It is noted in passing that attempting to define the word 'quality' is fraught with difficulties – if you think you have a good definition, take a look at <http://www.qualitydigest.com/html/qualitydef.html> and see how many of the ninety or so other definitions you agree with!

We can define *Innovation* as the process of making changes to something established by introducing something new. Innovation is often demonstrated with the TRIZ tools when available resources are used in a new way to solve a problem and create value. Hence with or without TRIZ innovation is generally seen as a 'good thing' and an indicator of a forward-looking organisation. Successful innovation is important in enabling a company to be more effective, efficient and competitive.

However, innovation also has a 'dark side'. Innovation is associated with change – and change often results in risk, uncertainty, disruption and inconsistency. This negative perception of innovation is felt most keenly in a production environment where the quality of the product is synonymous with the repeatability and consistency of the production process. In such an environment, any change, including deliberate and potentially beneficial change resulting from innovation, poses a threat to quality.

So most organisations are striving to produce high quality output through the use of a formal quality system and, at the same time, recognise that innovation plays an important role in their success. The 'dark side' of innovation (i.e. the harmful effects of change) can also be seen as a threat to quality, particularly in a production environment.



## Quality and Innovation: Friends or Foes?

This brings us to the central questions posed by this paper:

- Is there an inherent contradiction between the two cultures of Quality and Innovation?
- How can organisations work within a framework of a highly controlled and repeatable quality control system (typified by ISO 9000) whilst at the same time allowing and enabling a culture of innovation and creativity?
- Must Quality and Innovation always be in opposition or can they operate in harmony?
- Do quality and innovation harm each other – or can they be addressed in a way that brings mutual benefits?
- Is this a problem or an opportunity?

## Where and How does Innovation fit within the Organisation

Many organisations recognise the value of a ‘creativity culture’ that is promoting an attitude of creativity and innovation. This can take many forms, reflecting the different attitudes towards innovation and the prevailing beliefs about what makes innovation tick. For example, training courses, brainstorming sessions, thinking rooms, raft-building and even juggling have been promoted as beneficial to the creative process. Irrespective of the effectiveness of such attitude-enhancing activities, it is important to consider just how far this sort of encouragement can help.

There is no doubt that informal creativity methods and a positive creative attitude can play their part in innovation, however the same informality that benefits the process raises a number of problems:

1. Informal creativity/innovation can be stifled by the demands of the more formal ‘non-innovative’ processes taking place around it. There are often so many other formal processes that must be serviced that insufficient time or attention remains for creativity to flourish. Informality can be hard to take seriously.
2. The innovation activity can end prematurely, failing to identify or consider the best of the potential conceptual solutions. This occurs when the parts of the potential solution space are left unexplored, either as a result of an unsystematic approach, or because of the natural tendency to go with the first good-looking answer that comes up. The greatest threat to a really good idea that has yet to be thought of is the moderately good idea that is already there.
3. How is it possible to ‘measure’ whatever creativity or innovation has taken place? Measurement provides the vital closure of the feedback loop that drives quality and process improvement. How is it possible to improve innovation without some reliable and rational measurement of the effectiveness of the innovative activity? How is it possible to measure what’s happening inside the innovation activity to pinpoint specific areas for improvement? How can the innovation activities taking place within the organisation be managed and improved without metrics?



These problems with the informal approach suggest that the Innovation process needs a formal place in our formal processes – such as a proven Innovation Toolkit and an Innovation Audit. However, it is not sufficient to excavate a space in our processes for innovation to take place.

Innovation is not like compost making – it is not as simple as putting the ingredients together in a pile, establishing the right environmental conditions and sitting back expecting it to happen spontaneously. Reliably good innovation will not just happen. The right space and the right environment are not enough. One of the keys to successful innovation is careful and deliberate management of the innovation process itself which asks questions such as:-

- How much time and resource should innovation be allowed in any particular project?
- How do we know when innovation is finished and implementation can start? How do we measure innovation?
- How can we be confident that the innovation we are doing is of high quality?
- How can we be confident that we are developing not just an innovative solution, but the best possible solution for our particular need?
- How can innovation be controlled in such a way that it integrates with the rest of the organisation's processes?

Innovation needs a space. Not just any sort of space, but a controlled space.

### So where do we go from here?

Integration of the innovation activity into the overall quality system looks like a promising way of resolving the potential conflict between innovation and quality. This means managing innovation using formal procedures and processes – make it as much a part of Quality System as any other activity, subject to the same sort of procedures, metrics and audits.

The benefits of this approach are:-

- Improving the quality of innovation by ensuring that the full solution space is explored
- Forcing appropriate resources to be applied to the innovation.
- Making innovation measurable - and hence auditable and subject to improvement.
- Making innovation activities compatible with all the other processes in the organisation.

So far, so good, but before we can recommend the systematic approach we need to address a couple of closely related issues:

- Is a formal systematic approach to innovation possible? Is systematic innovation any good? Is it a contradiction in terms?
- Might systematic innovation kill-off or stifle the natural innovation of the inherently creative individual? Might it smother the 'Eureka moment' of a genius?



### Is Systematic Innovation a contradiction in terms?

Innovation is about finding solutions to problems. It implies the discovery of a new way of doing something – not necessarily new in absolute terms, but new to a particular person, organisation or application.

The naturally gifted innovator has a talent for analogous thinking - knowing where to look for promising solutions, though some combination of intelligence, knowledge, experience – less tangible qualities, such as intuition and luck may also play their part.

A systematic approach, on the other hand, implies the use of directed searches through possible solutions or classes of solutions. It implies algorithms that guide the innovator. It can (and should) include techniques for providing a formal analysis of the problem. It can incorporate techniques to open the mind of the innovator, to break psychological inertia – forcing new and alternative lines of attack. It can provide ways of tapping into useful solutions borrowed from other application areas. It can include lists, of both problem solving solutions as well as generic solutions. It can include specific mental tools and problem solving techniques.

Furthermore, a formal systematic approach provides an excellent foundation for co-operative innovation. It allows a team of innovators to share a common problem solving framework in which they can pool their individual creative talents that moves the innovative process far beyond mere brainstorming.

If all of this is then wrapped in a formal process it can be controlled, managed and measured as part of a wider Quality System. Every step along the way can be documented and audited. Innovation moves out of the head of the individual and into the wider organisation.

Far from being a contradiction in terms, Systematic Innovation is Innovation at its most effective – particularly in the corporate context and it exists, is proved in many companies such as Rolls-Royce and unlike many new initiatives is welcomed by intelligent and forward looking engineers. The systematic toolkit – TRIZ – was designed by engineers for engineers to guide them through the invention process, the innovation process and to find new concepts; (this is why it is called the only problem solving toolkit – because it takes engineers to proven solutions making innovation less risky).

### Will Systematic Innovation smother naturally innovative people?

This is an important question. The history of great innovation is full of naturally gifted innovators – people with the skill, intellect, knowledge or knack of seeing good solutions to challenging problems. The last thing we should do is to stifle such talent, or isolate it in some intellectual ghetto where it can neither bring benefit to nor benefit from the more formal systematic approach.

Can this sort of talent still ‘work’ within a systematic framework? Will such people become better or worse as innovators?



In practice there is no conflict. On the contrary, an appropriate systematic approach such as TRIZ can be a powerful complement to natural creativity. In the decades that TRIZ has been in use it has turned mediocre innovators into good innovators and good innovators into great ones. It also enables the creative talent of the individual to be used as part of a team. This is because:

- It does not prevent people from having intuitive 'unsystematic' ideas – instead it lets intuitive ideas occur at any stage in the process, ensuring that they are captured and properly considered. However, when such inspiration takes place, the rigour of the systematic approach ensures that the solution search does not stop prematurely at that point – instead it takes up the search where it left off and continues to search for more, and possibly better, solutions. In this way it ensures that the full solution space is addressed.
- It allows creative talent to be applied more effectively and more widely throughout the innovation process.
- It shares innovative 'best practice' within the team and across the wider organisation as each step in the innovative process can be recorded.
- TRIZ was designed to encompass all methods of thinking. TRIZ can be used in many different ways by different engineers. This flexibility comes from way that each element of the TRIZ toolkit is capable of delivering good solutions and the right answers. Good TRIZ engineers recognise that the toolkit consists of overlapping tools and can select the tools which best suit their thinking style and approaches; both in terms of tools which complement their approach as well as develop their way of thinking in areas they are less strong. TRIZ can make very creative people systematic and very systematic people more creative. This flexibility gives great scope to those who seek to integrate TRIZ into an existing formal quality system. For example, the possibility of cherry-picking elements from TRIZ could provide an interim or low-impact transition towards a formal systematic innovation process.

So there is no downside. None of the ideas or insights that would have occurred in the less formal approach are lost. Instead the systematic approach yields all of these and more: greater innovation, in both quality and quantity. In a team context this effect is even more marked, as the structured systematic framework encourages and enables cross-fertilisation of ideas and problem solving skills.

### Summary

We have seen that Quality and Innovation are not inherently in conflict. Far from being foes they can, and should be, the most intimate of friends. With appropriate innovation processes integrated into the quality system already in place, they will support each other: Innovation becomes 'Quality Friendly' and the Quality system provides a systematic framework which both enhances innovation and provides the basis for its management and improvement across the organisation.



## What Next?

The challenge is to incorporate a systematic innovation process into the organisation's Quality System. The nature and extent of this exercise will naturally depend upon the nature and structure of the existing quality system, so the suggestions presented here are generic and high level.

The first step is to identify an appropriate systematic innovation methodology to form the basis of the new or modified processes and procedures. At Oxford Creativity we believe that the TRIZ methodology is the only one that is both highly effective and also incorporates the type of systematic approach advocated in the paper.

The next step is to integrate TRIZ or TRIZ-like processes into the existing quality system. This is likely to require a multi-disciplinary team, composed of those having knowledge and experience of the existing quality system, those having knowledge and experience of using TRIZ and, most importantly, representative users of the new/modified processes. Once established in the Quality System there are two important follow-up activities:

- Measurement of the effectiveness of the new system leading to process improvement.
- Using the existence of the formal processes to foster and encourage the use of innovative techniques across the organisation, extending the process beyond the traditional areas of innovation/creativity such as engineering and marketing.

### **Andrew Martin**

Andrew Martin divides his working time between BAE Systems and Oxford Creativity. At BAE Systems Andrew is a Systems Engineer working on the development of training solutions.

At Oxford Creativity Andrew is a TRIZ Consultant, problem solving and teaching TRIZ with many companies large and small. Andrew believes that TRIZ processes should be embedded into company procedures to bridge the 'creativity gap' that must be crossed to develop new concepts.