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Aspects of teaching TRIZ in organizations

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Abstract

When introducing the thinking, methods and tools of TRIZ into an organization, TRIZ will initially be an "unproven case". A number of challenges emerge at this point, such as the contradiction between the required high quality of TRIZ training necessary to provide early proof points and the limited resources that are provided for the introduction of TRIZ.
Based on experience gained throughout a few years of introducing TRIZ into an engineering organization this paper further details challenges such as this and outlines possible ways forward to safeguard the successful deployment of the TRIZ way of thinking.

Keywords: TRIZ; teaching TRIZ; making TRIZ work; implementing TRIZ in large organisations;

1. Introduction

The organization in question is a large company with different businesses and with research, engineering and production sites spread all over the world. As in all large organizations different tools and methods are constantly evaluated and may be used to improve the innovation capabilities. TRIZ is no exception, and different TRIZ consultants and consultancies have had their go in the past - with mixed results. In isolated places throughout the company TRIZ had found a place in the way of working, and there were even pockets of excellence, in other places it was seen as an interesting tool however without any commitment or actions being taken, whereas in yet further places a distinct allergy towards TRIZ had developed.

2. Issues of implementing TRIZ in large organizations

When we engaged to structurally introduce TRIZ across the organization many different issues emerged which had to be dealt with to ensure a successful implementation:

Firstly, due to the organization structure and the mixed history of TRIZ in the organization a top-down introduction was not an option. This meant that a directive approach to the use of TRIZ was initially not possible and a different way had to be identified for TRIZ to be introduced, to proof its worth and to find its place.

Secondly, the teaching and introduction of TRIZ across the organization also had to occur in a way that ensured that a common language [1] was established and safeguarded for discussing engineering problems. The aim was to create a strong and unified way of using TRIZ. At the same time we needed to achieve this in an organization with a partial but erratic past experience in TRIZ, with businesses activities in distinctly different markets and with research, engineering and production sites spread all across the world.

Furthermore, once initial training sessions had started a question that quickly surfaced concerned the teaching of more advanced TRIZ tools. Digging deeper into the reasons for this request, a number of distinct causes were identified:

- In our introduction course we give a brief introduction to a number of more advanced TRIZ tools and many of students obviously developed a deeper interest in those, or wanted to improve their TRIZ skills in general.
- A smaller number of students were not engineers – the target group of the introduction course - but held different positions such as IP counsel, product architect or program manager. For those individuals the introduction course provided a starting point for understanding TRIZ, but they missed a deeper understanding of those tools that are specifically relevant for their respective professional tasks.

A further issue that was quickly identified concerned the use of TRIZ after the introduction course finished. Most participants are in principle well positioned to utilize TRIZ in the projects they normally work on. However, evaluation a few months following the introduction course showed that not all TRIZ users had continued to practice TRIZ in their daily work. In part this was attributed to the nature of some projects. Another significant part could be attributed to the power of the daily routine, which combined

with a high workload quickly pushes aside newly learned tools. Furthermore in different places throughout the organization "TRIZ champions" were missing, people that would have the experience to recognize opportunities to employ the TRIZ way of thinking.

Finally, we faced the initial problem of a lack of success history of TRIZ in the organization. Apparent success stories at other companies were often dismissed with comments such as: "but there is no guarantee that it will work for us!" etc. Also, key decision makers within the organization rightly stated that for an investment in TRIZ at a more in-depth level it would first have to prove its worth before funding for in-depth courses could be forthcoming. With successful own cases being the only way to move further the establishment of these was essential.

3. The approach

It is our belief that there are three critical elements to introduce TRIZ successfully and sustainably into an organization:

1. to prove the usefulness of TRIZ
2. to establish a critical mass of people trained in the method and
3. to engrain it in the daily way of working.

In order to ensure that these elements were established, we chose a step-by-step and bottom-up approach. This allows for moments of reflection and opportunities for alignment along the way. We identified a number of stakeholders [2] at key positions throughout the organization who had an interest in innovation and problem solving and we started working together with them. This allowed us to keep the initial risk and exposure on a manageable level. At the same time valuable alliances could be formed and pockets of excellence established. Another important aspect was the willingness of these managers to discuss the issues emerging on the way and to suggest approaches forward suitable for the organization.

We identified early on that it was essential to provide a way of teaching TRIZ that can be supported across a large organization without losing the common "language". Together with the wish to guarantee a certain standard of education this led us to adopt a certification scheme. Those schemes are provided for example by the International TRIZ Organization (MA TRIZ) [3]. Levels range from level 1, TRIZ user, to level 5, TRIZ master, and reflect an increasing knowledge and experience with the TRIZ way of thinking. A certification format has an additional benefit as it promotes for basic tools to be taught, used and mastered before moving to more advanced tools [4]. This not only to enable a good initial understanding of what TRIZ is about, but also to logically build up knowledge and experience. As can be seen in a lot of TRIZ literature [5] a mixture of teaching theory and exercises, also involving the study of cases from the pupil's practice, is generally advised as an ideal way of learning TRIZ. This approach is also reflected in the recommended workload for the different certification levels with a minimum of 12 -24 hours for the first level. With approximately three days of formal training a relatively low hurdle could be established for the wider acceptance of a structural TRIZ training, while at the same time a sufficient quality could be provided.

An additional benefit is provided due to the fact that the the certification scheme is used also by organizations outside of the own, which encourages benchmarking with those external parties and thus additional learning.

While participants in an introduction training have a basic set of tools for problem solving, they do lack a wider view of where and when TRIZ can advantageously be employed. Basically they will use

TRIZ for occasional problem solving, not for structural innovation. The obvious solution, and one that we are currently following up, is to train a number of engineers at different sites to a more advanced level. Those engineers will serve as TRIZ champions in the organization and can help to engrain the TRIZ way of working deeper in the daily way of working.

Furthermore, additional courses, outside of the certification program are being provided [6], for example teaching ways of dealing with patents. This enables participants to learn those tools that are most suitable for their specific activities without having to follow a number of possibly irrelevant themes along the lines of a certification scheme.

A number of ways have been identified to deal with the issue that participants of the introduction course do not sufficiently use TRIZ in their daily work. A first one is to educate the lower management levels to the TRIZ way of thinking. While they are less concerned with the direct application of TRIZ, knowledge about when it is useful to use which tool will help them in their task to support and guide the work of their engineers.

Secondly, the training of a number of engineers to a higher level and their use as TRIZ champions throughout the organization as mentioned previously will help other engineers to use their TRIZ knowledge more often and on a much wider range of subjects.

Thirdly, we are starting to establish group of engineers that are dedicated to support the rest of the organization with services related to TRIZ and systematic innovation, from training to the support of key projects.

In addition we are using the internal communication structure of the organization such as a dedicated online forum to build and extend a network of TRIZ users. Information on tools, questions, experiences and best practices can be shared.

Two different ways to create proof points for the organization were identified. We are involved on a regular basis in different high profile projects, and are employing the TRIZ way of thinking for those projects. This leads to a first collection of successful cases, also showing the use of more advanced TRIZ tools. Furthermore a few months after the course we structurally approach participants and collect data of projects where TRIZ has been used. This leads to a further line of successful cases spread through the width of the organization.

4. Conclusion and next steps

One of the most important points in the successful introduction of TRIZ is the establishment of successful case history within the organization in question. Nothing is more convincing and will provide the goodwill necessary for proper support. Ways of achieving this are initially to use TRIZ with experienced TRIZ users in key projects and building on this experience, to create a critical mass of TRIZ users which can apply TRIZ in their daily work.

Teaching TRIZ to a wide audience at an initial level is important for building a critical mass, but is not sufficient to gain confidence and widespread acceptation. The additional training of interested individuals in advanced skills is important to be able to apply TRIZ for a broad range of applications and not just for occasional problem solving.

If it is difficult to introduce TRIZ as a new way of working across the entire organization, the focus on a few key areas which are in need of problem solving and innovation is essential to create proof points and to create pockets of excellence.

The use of a certification scheme proved valuable in the introduction of TRIZ to a large multinational organization. It gives a unified structure to TRIZ - all parties learn the same language and interpretation

of the “rules” - and it provides a way forward for interested TRIZ users to learn more in an organized way.

All above mentioned elements are essential to create and sustain learning organizations beyond traditional training and fragmented use of the tools.

References

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[2] see for example: Rantanen K, Domb E, *Simplified TRIZ*, 2nd ed. New York, London: Auerbach Publications, 2008, p. 201

[3] MA TRIZ website, *Certification*, http://www.matriz.org/start.php

[4] see also Rantanen K, Domb E, *Simplified TRIZ*, 2nd ed. New York, London: Auerbach Publications, 2008, p. 233

[5] Salamatov Y, *TRIZ: The Right Solution at the Right Time*, Hattem, The Netherlands, Inxytec B.V., 1999, Foreword

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