

The forth in a series of articles concerning invention conception and patent filing/prosecution strategy for small to large organizations from an inventor, engineer and product developer's perspective.

In the previous 3 articles we laid out three areas of focus for business success;

- When and why to patent to protect and grow your business
- Opportunity mapping, the benefit focused genesis of a product portfolio
- Invention Workshops; A Cross of Technology Push with Customer Pull

In this article I want to highlight some proven tools that, when applied skillfully, can help you breakthrough your own mental interia or your team breakthrough the tribal mental interia that is naturally inherent in any organization.

Mental Interia, a quick rehash:

In order to cope with the vast amount of sensory information coming at us all the time, we:

- *magnify*
- *generalize*
- *compact*

information to make a **personalized filtered model** of our world.

Our **filters** include our

- *Habits/Beliefs*
- *History/Tradition*
- *Policies/Procedures*
- *Rules/Guidelines*
- *Education/Past experiences*
- *Culture, etc*

With basically, everything that guides our actions

To overcome mental interia there are many tools to help us change perspective and “get out of the box” in our problem solving and creative thinking. One of the more rigorous systematic proven tools is TRIZ.

TRIZ (/ˈtriːz/; **Russian**: теория решения изобретательских задач, teoriya resheniya izobretatelskikh zadatch, literally: "theory of the resolution of invention-related tasks") is "a problem-solving, analysis and forecasting tool derived from the study of patterns of invention in the global patent literature". TRIZ was developed by the Soviet inventor and science-fiction author Genrich Altshuller and his colleagues, beginning in 1946.

[Wikipedia](#)

Thus, TRIZ is essentially a summarized & indexed collection of the world's known solution methods gleaned from patents, (patents: are essentially the documentation of a solution for a

given problem). Thus, by framing your problem with the indexed standardized problems, you can pair with the standardized solution paths and explore options for your situation.

The TRIZ index of solutions is straightforward and comprised of:

1. 40 inventive principles to resolve a contradiction
 - a. *where both benefit & harm are produced at the same time*
2. 76 standard solutions
 - a. for improving beneficial effects
 - b. for reducing harmful effects
 - c. for measuring
3. 8 patterns of technical evolution
4. Scientific effects database
 - a. A free to use encyclopedia of “how to” with descriptions & examples

There is also the use of *clever little people*, a *visualization technique* to put yourself (via appropriately sized surrogate clones) into the problem situation.

Practitioners of TRIZ can be zealous with expounding on the power of the methods. However, TRIZ alone will not give you an answer. It takes the synthesis in the brain of a curious & clever person to come up with a seed to a plausible concept solution. TRIZ tools guide you in directions to look at for inspiration. Though conceptual solutions can come from anyone, it is our (my associates and I) experience that some level of expertise (fundamental understanding and experience) in a group is essential. Team or group thinking (three or more individuals), also enhances the outcome as multiple perspectives can both challenge and accelerate the thinking in the formulation of a robust concept solution.

There is a flow when a group can openly combine tacit and external knowledge in an unimpeded *what-if* environment. In that flow we see big ideas conceived.

Once plausible concept solutions are formulated they often need further vetting and engineering into something workable. The challenge then becomes not losing ideality or value of the concept solution. Often, as your solutions evolve one or more problems may surface. TRIZ tools can then be subsequently applied to drive solutions for the new issues that arise while maintaining or growing the value of the original concept.

Applying the [kiss principle](#), TRIZ techniques break problems down into simpler elements and when used most powerfully, TRIZ is applied in a logical sequential manner.

1. Define your context & goal
 - a. what is sought, benefit(s) to be delivered
 - b. What is current state, where do you want to get to
2. Articulate an Ideal state
 - a. Scope pure benefits and delivery without issues or costs
 - b. Any ideas/concepts generated, clearly park these in a solution list for participants to draw on later.
3. Map functions of an existing systems elements used to deliver the benefits
 - a. Describing in very logical terms of subject that provides action on an object
 - b. Functions deliver benefits**
 - c. compare with the ideal to reveal issues of insufficiencies, harms, contradictions, or some function that is missing
4. Employing the TRIZ indexed solution tools we;
 - a. explore, inspire, generate concept solutions.
5. Assess concept solutions and drill down to resolve the subsequent issues.
6. Document your conclusions and recommendations going forward.

Again, TRIZ is most powerful when applied in a logical sequential manner. However, this process can become very mechanical and draw down the “creative juice” when working with a larger team. Thus, we seek to integrate TRIZ tools into the invention workshop where flow works against both the individual interia and tribal mental interia highlighted in the opening section.

Integration of TRIZ into Invention Workshops

The invention workshop process we practice was developed by innovation folks at Kimberly Clark (consumer paper goods) incubated at [Synectics](#) and later expanded and tailored for clients by [Vincent & Associates](#). It builds tacit “tribal” knowledge growing as a group focuses and engages to provide targeted solutions.

This invention Workshop process runs similarly to TRIZ with a focus on what is wanted/needed from a business perspective and articulates this through an Opportunity Statement. This is the directional northstar for the workshop as it serves as the grounding point to keep the workshop participants on task and broadly define the solution criteria. I.e. Does the inventive concept provide a valuable benefit and align with the clients strategic business plan?

In TRIZ speak, *the Primary Output that delivers the Ideal Solution to some degree*. Additionally, working through a TRIZ nine box parallels the part of the pre-workshop planning with the contact client to set output, set context and scope. Again, this keeps the solution team focused so that biased based creep is limited if not eliminated. Then working through the TRIZ nine box in the “*Getting Focus*” sessions with the workshop sponsors allows for business needs and vision to be collaboratively expressed for the solution team to absorb.

As explained in the previous blog; 1) High level concepts are generated that highlight benefits to be delivered to support market plans. 2) Next, targeted brainstorming with a collection of diverse experts in an invention workshop provides solution concepts springing from the first batch of “I wish” and “How to” thoughts. 3) In the “*Springboard Depth*” portion of our invention workshops we expand the solution concepts using “Ways and Means” and/or “Plus and Minuses”. This is where specific TRIZ indexed solutions such as the effect database and standard solutions can be used.

Often we have the pro’s & con’s, *pluses* and *minuses* with any concept solution. Here is where we need to think in terms of contradictions then frame our problems in the **subject > action > object** syntax for using the contradiction matrix to provide high level “abstract” solution concepts as stepping stones to our brainstorming which can help overcome psychological inertia.

The last steps are critical in that the final ideas and concepts may stand alone but are better when articulated in context and with respect to benefit to be delivered and how that aligns with strategic market plans and business goals. Typically one or more individuals provides this write up and it is presented to the workshop solution team first for peer editing and then to patent counsel for any clarification issues and finally to the workshop sponsors as input for business planning.

Summary

In this series of blog articles; 1) we’ve gotten through the reasons and means for building a patent portfolio. 2) Mapping out opportunities for the market. 3) The invention workshop process and now 4) introduced the use of TRIZ tools to augment invention workshops and sharpen concept solutions.

I have helped clients with framing their challenge and sometimes it is a quick fix, other times we need to delve deep. Contact us to discuss your business needs. Together we will work out a

plan on how best to help you. I truly look forward to sharing my experiences in identifying opportunities and developing protectable solutions with you and your team!

The next post may be an editing and reposting of a presentation on; TRIZ for Patent Design Around and Robustness.

Note: A presentation given in a Des Moines, IA manufacturing conference September 28th has been posted.

Sincerely,
[Steve Kuehl](#)