machine design

TRIZ Plus – A Modern Tool for Enhancing Design Innovation

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TRIZ, an acronym for a Russian phrase loosely translated as the "Theory of Inventive Problem Solving," has received little mention in *Machine Design* over the years. There were half a dozen articles in the 2000-02 timeframe, about a decade after it made its first U.S. appearance. Bradford Goldense, president of Goldense Group Inc. and a regular *Machine Design* contributor, mentioned TRIZ in his writings twice--once in 2006 and again in 2013. And, it showed up in a Letter to the Editor commenting on a 2010 article on innovation. These findings, in my experience, are typical of most trade magazines.

In a recent telephone call with Mr. Goldense, I asked about his 2013 column wherein he identified TRIZ as one of 300 innovation tools being used by manufacturing and high-tech firms in the U.S. According to his firm's research in 2008, about 21% of the companies surveyed are either "aware" of TRIZ, "use it occasionally," or have "fully embedded it" into their innovation process. At 21%, TRIZ ranked No. 4 in popularity among the 300 tools studied. He believes little has changed as of 2015. More importantly, Brad described TRIZ as the "most powerful tool for an individual user to enhance design innovation" among all the tools and techniques that exist. A powerful endorsement!

Given its potential impact on the ability of engineers and scientists to create novel new products, this lack of attention in most current industry trade magazines, including *Machine Design*, is surprising.

I was first exposed to TRIZ in 2008 and have become a strong advocate since. The classic version of TRIZ was all about solving a particular problem, even if it was the wrong one. Great progress has been made over the past two decades, however, as a flood of Russian practitioners moving to the West have modified TRIZ to work within a capitalistic environment where market forces and profitability matter. In its most advanced form, whether as an embedded tool in software or applied manually, TRIZ promotes use of a market-driven scientific problem-solving approach, minimizing dependence on individual "moments of inspiration." This more modern version, call it "TRIZ Plus," promotes innovation by:

- Ensuring you're working on the right product in your portfolio, so you maximize ROI on the firm's R&D budget.
- Identifying product features that will affect your customers' buying decisions, so your efforts lead to innovations which create higher margins on your products or greater market share.
- Focusing on functions rather than system components, opening up a much broader range of potential solutions, some well outside your traditional knowledge base. This is also useful in helping you overcome "psychological inertia," that is, practices which narrow your approach to the same channels you've traditionally used.
- Addressing underlying root causes – key problems – rather than the initial problem you may have been presented.
- Helping you resolve technical and physical contradictions rather than simply looking for an acceptable compromise between competing system demands.
- Making it easier to leverage global knowledge that can be accessed via the internet or elsewhere through a function-oriented search algorithm.
- Encouraging the adaptation of proven solutions from other industries that can be adapted to your particular needs whenever possible, rather than inventing from scratch.
- Identifying trends that suggest evolutionary winners.

Each of these benefits deserves a more lengthy explanation and will be discussed in a future post.

TRIZ Plus is a tool every engineer and scientist should have in his or her toolkit.

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