

Tools for innovation and breaking intellectual inertia

TRIZ

Everyone wants growth – but how? We know innovation is a key to growth, but how do we do it? Be creative, break the rules, think out of the box, think real hard, innovate. Those words don't help me. What do I do differently after hearing them?

I am process person, processes help me. Why not use a process to improve innovation? Try this: set up a meeting with your best innovators and use “process” and “innovation” in the same sentence. They'll laugh you off as someone that doesn't know the front of a cat from the back. Take your time to regroup after their snide comments and go back to your innovators. This time tell them how manufacturing has greatly improved productivity and quality using formalized processes. List them – lean, Six Sigma, DFSS, and DFMA. I'm sure they'll recognize some of the letters. Now tell them you think a formalized process can improve innovation productivity and quality. After the vapor lock and brain cramp subsides, tell them there *is* a proven process for improved innovation.

A process for innovation? Is this guy for real? Innovation cannot be taught or represented by a process. Innovation requires individuality of thinking. It's a given right of innovators to approach it as they wish, kind of like freedom of speech where any encroachment on freedom is a slippery slope to censorship and stifled thinking. A process restricts, it standardizes, it squeezes out creativity and reduces individual self worth. People are either born with the capability to innovate, or they are not. While I agree that some are better than others at creating new ideas, innovation does not have to be governed by hunch, experience and trial and error. Innovation does not have to be like buying lottery tickets. I have personal experience using a good process to help stack the odds in my favor and help me do better innovation. One important function of the innovation process is to break intellectual inertia.

Intellectual inertia must be overcome if real, meaningful innovation is to come about. When intellectual inertia reigns, yesterday's thinking carries the day. Yesterday's thinking has the momentum of a steam train puffing and bellowing down the tracks. This old train of thought can only follow a single path – the worn tracks of yesteryear, and few things are powerful enough to derail it.

To misquote Einstein, the thinking that got us into this mess is not the thinking that gets us out of it.

With intellectual inertia, it's Einstein spelled backwards. The thinking that worked before is the thinking that will work again. But how to break the inertia?

I have found TRIZ helpful in breaking intellectual inertia. TRIZ, a Russian acronym for the *Theory of Inventive Problem Solving*, is a set of formalized processes to do innovation well, with a particular ability to break intellectual inertia using something called Lines of Technical Evolution. Just as laws of physics predict a projectile's parabolic motion over time, TRIZ's lines of evolution predict paths of evolution of technological systems over time. That's right, I said *predict*.

Here's an example of one line – the line of increased flexibility (which is a subset of the line of increased dynamism if you're a TRIZ stickler). This line says systems become more flexible and more adaptive to their environment. A stiff or rigid system develops one joint, then many joints. From there it becomes elastic, then fluid, and finally uses fields (e.g., light, magnetism) instead of substances. This evolution is shown schematically below.

"Unless you try to do something beyond what you have already mastered, you will never grow."

Ronald. E. Osborn

Where Lean
Thoughts
can become
Reality

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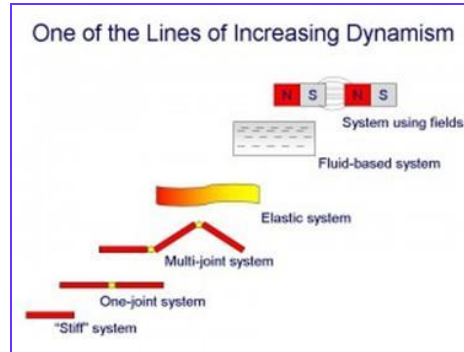
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The line of increasing dynamism for a computer keyboard is shown below. (From [Fey.](#)) Click on image to enlarge. Starting with a rigid keyboard, it develops a single joint, multiple joint, and then evolves into a roll-able, elastic keyboard. Finally, substances are replaced with a field, where a light based mechanism projects a keyboard on a surface and captures keystrokes by tracking track finger position.



I urge you to look at your product through the lens of increasing dynamism (flexibility). I bet some of your intellectual inertia falls by the wayside, and innovative ideas spring to mind. It's funny what a little bit of process can do for your thinking, even the innovative kind.

Crispin Vincenti-Brown identified four dimensions to manufacturing:

- . **Engineering.** The process, manufacturing and industrial engineering of production lines, including equipment selection, process development, production line layout, and workstation design.
- . **Logistics and production control.** Physical distribution and the information superstructure to make it happen.
- . **Organization and people.** Team , leadership and support structure. Human resource policies, wage systems and career development.
- . **Accountability.** Selection, calculation and communication of relevant metrics, and their enlightened use in managing the business.