

### **Insourcing Innovation**

*How to transform business as usual into business as exceptional*

**Interview with authors David Silverstein, Neil DeCarlo and Michael Slocum**

#### **Why did you title your book *Insourcing Innovation*?**

Our belief is that companies rely far too heavily on outside help when developing strategic and tactical innovations. They fall prey to the notion that to be truly innovative, you must hire people from other industries to spark creative thinking and development. While outside help can be significant, this approach is limited, especially in a world where technology development from regions like Asia is picking up speed and prowess.

Further, some American companies like P&G and Whirlpool, are getting really serious about innovation, and there is a formidable race developing for continuous invention, and broad-based innovation. We are seeing these companies turn resources inward – teaching their engineering and scientific communities, and others, to innovate faster and better – and this is helping them to compete more successfully.

#### **What is the biggest problem with the way businesses innovate today?**

Businesses today lack a consistent, repeatable, proven method for coming up with new ideas – and this lack of process is costing them time and money they can't afford to waste. From the way they brainstorm to the way they talk about and define innovation, and from the way they gauge ROI success to the way they train others to be more innovative, there are no standards.

A lesson from Quality fits here. Before DMAIC, before Lean, before the Baldrige criteria, before Continuous Improvement, what was there? There were a lot of companies talking about improving quality but not a whole lot doing anything significant about it. The biggest problem with the way companies innovate today is that they don't value it like they value improvement. They don't measure it; they don't monitor it; they don't drive it; and they don't control it.

#### **What is TRIZ and why does it hold so much potential for corporate business?**

TRIZ is an acronym for a Russian phrase that, translated, means the "theory of inventive problem solving." TRIZ has a very long and proven history that dates back to 1946 when its founder, Genrich Altshuller, began his groundbreaking work to codify and structure how innovation works at the strategic and tactical levels. TRIZ is the code that lies behind any innovation of any kind in any field of endeavor at any time. If you know the code, you can achieve innovation with little or no unnecessary resistance.

#### **Who's using TRIZ?**

Some Companies using TRIZ are Motorola, LG, Lockheed Martin, ITT, Samsung, Ford, Dial, IBM, P&G, Rockwell, Datacard, Clorox, Siemens, HP, DuPont, Eli Lilly, Honeywell, Raytheon, NASA, Borden, Toyota, Fujitsu, Hitachi, Caterpillar, Case, Cummins, Delphi, Boeing, McDonnell Douglas, USPO, Daimler-Chrysler, General Motors, Xerox, Kodak, Intel, Pilkington, Electrolux, Sanyo, Avon, BMW, Rolls Royce, Sara Lee, Pfizer, Kimberly-Clark, PSA Peugeot Glacio, Johnson & Johnson, Heidelberg, NEC Electronics, Shell, The Gillette Company.

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### **If TRIZ is so powerful, why has no company embraced it the way Jack Welch embraced Six Sigma?**

Understandably, companies allocate resources first to what they consider to be their most immediate needs. This means that process improvement initiatives get attention, while innovating new products and processes gets neglected. It's really just the age-old problem of short-sightedness and the terrible temptation to focus only on the immediate term. But we know the best companies that have been around the longest split their attention between the short- and the long-terms. They use profits from their existing generation of offerings to produce cash that is then invested in future offerings.

Given this, the best answer we can give is that CEOs are too busy holding on to the present, and they don't have the vision to seize the future like they could with a visible deployment of TRIZ. We do see division and departmental vice presidents deploying TRIZ widely and deeply, especially in certain industries, including healthcare. We think it's just a matter of time before more CEOs champion their companies into the future with TRIZ the way Jack Welch championed GE into the future with Six Sigma and other initiatives.

### **How can a company deploy TRIZ and what return on investment can it expect?**

This is where we think the Six Sigma deployment model is instructive. TRIZ needs executive support. It needs champions. It needs black belts or their equivalents. A TRIZ deployment needs to be supported by a training plan, a set of financial metrics, a system to determine ROI at the project level, a process for selecting TRIZ experts and good communications. As for specific ROI, TRIZ operates primarily in the domains of cost reduction\avoidance and revenue growth, so these are the two key metrics. Other metrics are related to the volume of patent generation, the quality of patents and speed at which innovation is achieved.

### **Which organizational functions need TRIZ the most and which the least?**

At this stage, most companies are applying TRIZ at the technical level in R&D. However, TRIZ is extremely applicable at the strategic level, and many companies with whom we work are using it there quite effectively. In addition to solving the technical quandaries associated with any single new product development, an organization needs a multi-generational product plan that defines the overall evolutionary roadmap. TRIZ provides the necessary codification for developing a roadmap that can help companies "stick to the future."

Eventually TRIZ will find its place outside the confines of engineering and strategic planning, leveraging the proven DMASI TRIZ methodology. We will see TRIZ across operations, sales, marketing, procurement and the many support functions. Right now, the focus is in design and R&D. But it would be a short step for companies to apply TRIZ to manufacturing, where the focus would be one of finding more innovative ways to make existing products, not just to design new ones.

### **What is the TRIZ methodology?**

The TRIZ methodology is Define-Model-Abstract-Solve-Implement (DMASI). You **Define** the system or innovation problem in question and develop the Ideal Final Result (IFR). You frame your innovation "contradictions," define a resource model and estimate the financial benefits expected from the project. Then you **Model** the system using Function Modeling and Substance Field Modeling (SFM). Then you **Abstract** your problematic contradiction using the TRIZ algorithm of Specific Problem to Generic Problem to Generic Solution to Specific Solution. Combining your work in Model and Abstract, you determine the ultimate feasibility of various innovation pathways and **Solve** your contradiction. Then you **Implement** your TRIZ solution.

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### **How does the TRIZ problem-solving algorithm work?**

This is an interesting question because this is where we can tell you a little about the “code” of TRIZ. Many innovation theorists and practitioners claim that using analogy and abstract thought is the best way to come up with good ideas. But none of them can give you a framework that you can use to streamline and optimize the process of abstraction. This is a very important point and it gets to the heart of TRIZ.

TRIZ provides people with a structured, repeatable approach to coming up with new ideas. TRIZ gives the inventor a set of “Standard Solutions,” “Problem Parameters,” “Separation Principles” and “Inventive Principles.” These are the generic elements of TRIZ’s algorithmic model whereby the innovator can take a specific innovation problem and solve it using a structured creative guide we call the “code of invention.”

### **How were all the patterns, principles and solutions of TRIZ discovered and codified?**

That’s what Genrich Altshuller started in 1946, when he began his investigation into the world’s database of 2.5 million patents. After a decade and more than 1500 person years of research, Altshuller and his team codified the essence of innovation. Since that time, many TRIZ practitioners and scientists have continued to analyze patents in an effort to keep the principles “current.” With some exception, these efforts have yielded little extra by way of Altshuller’s original 39 Problem Parameters and 40 Inventive Solutions, testifying to their original universal and timeless nature. But there have been substantive TRIZ developments and contributions in the areas of modeling and other conceptual fields that are continuing add-ons to the original body of work.

### **A central tool in TRIZ is the Contradiction Matrix. What is this?**

The matrix is a spreadsheet with 1521 cells formed by the intersection of TRIZ’s 39 Problem Parameters crossed with themselves. Inside each of these cells, according to the discoveries of Altshuller’s work, resides any number of 40 Inventive Principles. The Inventive Principles are the answer to the inventor’s question of, “which path do I go down to maximize my chance of finding the right solution?” *Insourcing Innovation* describes the matrix in detail and how it is the centerpiece of the innovation algorithm.

### **You talk about “psychological inertia” in *Insourcing Innovation*. What is this?**

This is our term for characterizing all of the current and commonly used creative thinking, innovation and brainstorming methods people use to “get out of their box.” The reason we call these methods *psychological inertia* is because they all simply spark the mind to think as *divergently* as possible. You don’t want this! Even though your intuition, common sense and frequent practice would have you do so. If your mind is in a box, and if you use these types of methods, they will only amplify or magnify what you know, while your goal is to discover what you don’t know.

We like to think of psychological inertia in terms of solution pathways, and in terms of the human mind’s habit of jumping from one pathway to the next. But whether you’re one to “jump around in your mind” or “stay the course,” it’s all coming from you – the sphere of material (mind matter, memories, experience, etc.) you can call into RAM at any given time or in any given session. We believe this is extremely and quite unnecessarily limiting, and that TRIZ can deliberately move you away from the inertia of your own mind toward the place where you’re likely to make a discovery or breakthrough.

### **Your book has an entire section devoted to Total Performance Excellence. Why?**

In the management world, we’ve seen a clear evolution towards continued complexity then simplification as the methodologies related to Improvement, Innovation and Strategy have evolved. Basically, in each of these three domains, management methods have become more structured and systematized over time. As they do, they become bolted onto each other to streamline their implementation and maximize their value. Our book is very specific about how this evolution has occurred.

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Eventually, we believe management will become a function of one large system we colloquially call the *Grand Unification Theory of Business*, believing also that this is more of an ideal than a mathematical reality. As we look at the systemization of strategy formulation and improvement through various tools like Strategic Planning and Lean, it's easy for us to see how it's all moving together. It's also easy to see how the systemization of innovation is one of the next logical steps in this movement towards a Grand Unification Theory and practice.

**Your book also talks about a concept called "Corporate Brownian Motion." What is this?**

Corporate Brownian Motion is the result of executive decisions made from a place of politics rather than practicality. It is also the result of decisions made in the interests of various corporate constituents, rather than from the place of what is good for the whole. Way back in 1954, Peter Drucker called this phenomenon "the activity trap." In business – and in society at large – we suffer from the activity trap – fragmented thinking that leads to disassociated actions.

Borrowed from Physics, this notion of Brownian motion refers to the phenomenon observed through a microscope when looking at particles suspended in liquid or gas, as they erratically dart around from constantly colliding with molecules. There is no predictable direction or pattern, only activity. This is Corporate Brownian Motion: a lot of uncoordinated energy but no discernable movement in any direction. Our remedy for this is to look at your business in terms of a holistic system, and to make decisions within a "total performance" framework, which we define.

**How does TRIZ compliment or contradict Six Sigma and Lean?**

All of business is the drive to provide value better, faster and cheaper than you do now. This is the profit motive broken down into its key components. Whereas Six Sigma is a tool for making business better (reducing defects and variation), Lean is a tool for making business faster (time and waste reduction). By virtue of doing both of these, you obviously drive down cost, so business gets cheaper.

The role of TRIZ is in helping you jump beyond your current model, or basic way of generating value at the strategic, operational, process and product levels of the business. It's easy to see that TRIZ compliments Six Sigma and Lean by spawning this next new way for meeting any and all societal needs, which are the lifeblood of business. We suppose we could say TRIZ contradicts Lean and Six Sigma by trying to replace the products and systems they improve. But this is what you want.

**What about Design for Six Sigma. Isn't that a tool for innovation too?**

DFSS is a world-class collection of methods and capabilities – a systematic process – for reducing a concept to practice with a high probability of commercial success and manufacturable (or deliverable) at a Six Sigma level. DFSS can be used to aid in the process of innovation, especially when it's focused on the ideas generated by the inventive mind, or by TRIZ. But the gravity of tools in DFSS will generally help you max out the value of your current paradigm. On the other hand, the gravity of TRIZ tools will help you break out of your current paradigm when you're after innovation rather than optimization.