



Using Inventive Problem Solving -TRIZ

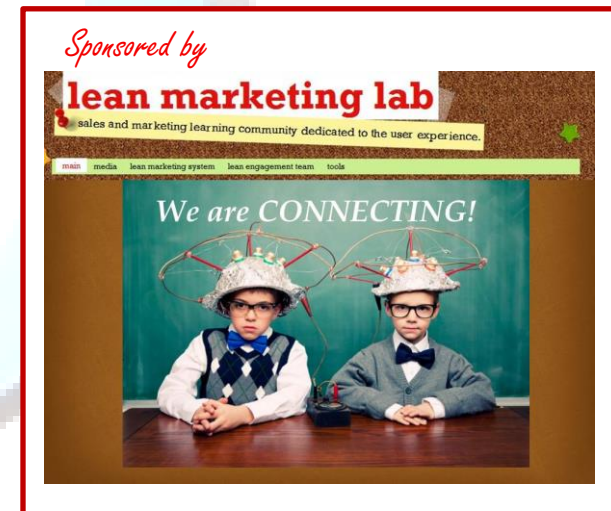
Guest was Ellen Domb

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Ellen Domb is a TRIZ expert, co-author of the book, [Simplified TRIZ: New Problem Solving Applications for Engineers and Manufacturing Professionals, Second Edition](#), and founder of the [PQR Group](#), a TRIZ training & consulting.

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Transcription of the Podcast

Joe: Welcome everyone. This is Joe Dager, the host of the Business 901 podcast. With me, today is Ellen Domb. She is the founder of PQR Group and founding editor of The TRIZ Journal. TRIZ is Dr. Domb's 6th career: she has been a professor, an engineer, a manager, and a strategic planning/quality improvement consultant. In 2005, she was named by Quality Digest Magazine as a leading voice for the future, citing the integration of TRIZ for innovation in quality improvement and quality planning systems. Ellen is also the author of *Simplified TRIZ* and a hidden treasure that I recommend is a book she co-authored called *Beyond Strategic Vision: Effective Corporate Action with Hoshin Planning*. Probably the most practical book I have found on Hoshin. Ellen, I would like to welcome you, and how did a strategic planning consultant end up in the world of TRIZ?

Ellen: Well, hi Joe, and thank you and thank your audience for welcoming me. I have to tell you that it was not a very strategic method of getting into TRIZ. Three times in three weeks I got three phone calls from people I had worked with primarily in quality function deployment and in Hoshin Kanri, Hoshin planning. They all said the same thing. They said,

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“Have you heard about this TRIZ stuff? It’s going to change everything.” Before we get too much into the spiritual side of when things happen in threes, somewhere between phone call number two and phone call number three, I went and took a seminar. By the time I got phone call number three, I was able to say, “Yes, indeed, I have heard of it. And yes it is going to change everything. And what can we do?” So engineer and strategic planning-type people don’t tend to be very mystical, but three phone calls in three weeks is what got me there.

Joe: Can you start off by giving a high-level description of TRIZ?

Ellen Domb: TRIZ is an acronym. T-R-I-Z. And it’s a Russian Acronym for theory of inventive problem solving. And don’t worry about the word “theory” because, in fact, TRIZ is a whole bunch of very practical methods for creative problem solving. The thing that I have found that some people do is separate their own problems, their own company’s problems, from their customer’s problems, which is somewhat how we get, “Is it a profit problem, or a product problem?” But if you use the same method on all of them, you don’t have to learn two methods. I find that if you solve a customer’s problem – you’ve got a new product or a new service or a new offering – and if you solve an internal problem, you’ve got improved processes or higher margins. In other words, it’s all good stuff.

What TRIZ is a systematic way of looking at the problem and applying the solutions that have been developed by other people, both in your own industry and other industries. The magic of TRIZ is understanding how your problem related to other people’s problems and how you can use other people’s solutions to solve your problems. In other words, there

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really is no magic. It's a method of analysis and then a method of using databases. Does that help you, Joe?

Joe: In today's world, we talk about co-creation, open innovation and things. TRIZ seems like this engineering thing to me. Is it something we can use in fields like co-creation and open innovation?

Ellen: Absolutely. One of the reasons that people come looking for TRIZ these days is that they've tried open innovation methods without a lot of success. What they find is that the TRIZ method of analyzing a problem helps them write a much better open innovation – they usually call it a challenge or an open innovation inquiry. If they use the TRIZ method, they sometimes don't use it to get the answers; they use it to get the better questions. The reason for co-creation, especially when it's supplier/customer-type co-creation, is because you need the knowledge that other people have that may be outside your company. Well, TRIZ starts out with the function that you need other knowledge, not only from outside your company, but probably from outside your discipline. It helps you formulate the problem in a way that you can go use that other knowledge.

Joe: When I first look at TRIZ, I see all these building blocks and hierarchy structure that's step-by-step. The methodology seems really weighty and complicated. Is it? Or is it simple?

Ellen: Well, you could say that about almost anything. How about the simple version of Six Sigma? Historically, I think with a lot of systems, including TRIZ, the people who did the research when they went off to try to teach it, they were so excited about what they did

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that they wanted to give you 15 years' worth of research and then give you the system. And so, it got complicated. The advantage to people like me who learned it later is that we were able to take a point of view of saying, "Okay, what does a beginner need to do to get started?" So, let's say modern TRIZ is simple. If you tried it 20 years ago and thought it was too complicated, give it another chance.

Joe: Well, you mentioned something at the very beginning that struck me: "You have to see this, Ellen. This is something that's going to change the world." It's not that popular. Why hasn't it changed the world? Why hasn't it caught on?

Ellen: Let me answer a question with a question. I know a large percentage of your audience is involved in Lean and Six Sigma. One of my favorite discoveries back in my time in the aerospace engineering world was Dr. Taguchi's methods. Because using Dr. Taguchi's methods for robust engineering, you could take something that would require ten thousand experiments by classical design of experiments and get an equally legitimate answer by doing 27 experiments. I thought this was the greatest thing in history. I wish I'd known it in graduate school. I wish I'd known it in elementary school. I couldn't understand why every single science student in the universe didn't learn this in their first course. Here was something measurable and verifiable and yet everybody wasn't using it.

When you turn around and ask the same question about TRIZ, TRIZ involves creativity and creative and innovative change. A lot of people have ideas about creativity based on their own past and their culture. Creativity is hard to measure so asking people to try a new

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method of creativity without an agreed upon measure for, "How will they say that it's better?" That's a real challenge. If it's taken 60 years and they still haven't accepted a new statistics method that is measurable, how long is it going to take them to accept a new creativity measure? My best response to people who want me to prove that it's better is to say, "Try it on one problem and then you tell me." How can I prove that it works in your environment? I can't, but you can. So, getting people to try it hands-on has been the only reproducible way of getting people to believe that it works because creativity is in the past.

Creativity is a personal thing. I think with TRIZ; creativity can become more of an organizational thing. But again, if people are convinced that it's personal and intuitive, they won't be willing to change until they've had the experience. I will tell you that the experience changed me. I was never a creative person. I was always the hardworking person. You, Joe, come up with a creative idea. I would go build you a new laboratory. I would go get the budget for you. I would do anything to make it happen, but I wasn't the one who came up with the creative ideas. The liberating thing about TRIZ is, my initial thought was, "Hey – I'm imitating what those creative people did." It was such a wonderful feeling that I wanted more of it, so I kept doing more of it. Does that begin to answer your question?

Joe: So I can make an engineer a marketing guy?

Ellen: The more interesting thing is you can make a marketing guy understand the engineer because that's creativity, too.

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Joe: When I look at TRIZ, and I look at the different road maps of it, it does seem very structured. Is there a certain four-step formula or four-step that I can look at and understand what TRIZ is about?

Ellen: I can give you a generic road map. This is hard to do on a podcast because I'd much rather have diagrams to point to, but I know you're going to give people some websites in the end so I'll use that as my excuse. But the road map for any individual creativity problem. There are families of tools that are used to analyze the problem. One of the things that those analysis tools do is try to break you away from assumptions about the solution. Break you away from jargon and technical language about the solution. This liberates you to use solutions from other areas, and it liberates you to look at, "What would the world be like if I didn't have this problem?" Instead of just, "How do I make the problem may be cheaper or easier to live with?" So the first chunk of the road map is a detailed analysis and changing the language so that you can go elsewhere. Now these days we have good search tools. A lot of the search tools are so-called semantic search tools. In other words, you want to liberate yourself from buzzwords and key words and get yourself into the issue of, "What are the functions that you're trying to accomplish?" So that's the first step in the road map.

The second step in the road map is the type of problem. Many of the TRIZ problems are contradictions. Contradictions, some people, call them trade-offs. "This gets better but that gets worse." If you know this applies to business problems just as strongly as to engineering problems, right? I want to give better customer service, but I don't want to hire more people. I want to have better employee morale, but I don't want to spend any

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money on improved education benefits. Just as much as I want the product to be stronger, but I want to make it out of lightweight materials. So, the trade-off class of problems is a class of problems that has been examined in TRIZ for many years, and so there's a large database of how did other people solve each class of trade-off problems?

The next step is if you have contradictions, which kinds of contradictions are they, and which part of that database should we use? Then how to draw analogies out of that database that could be used to solve my problem. For instance, you're in the banking industry looking at people versus training issues. What can you learn from the insurance industry? What can you learn from the health care industry? This is what we used to call benchmarking in the days when I was doing things like Baldrige-Award-quality activities. Benchmarking is an extremely valid way for one company to learn from another. As long as you don't go out there and try to copy what the other company did, but learn from it. The initial step is the problem analysis. The next step is, "Do I have contradictions? And if I do, which category of contradiction and how do I use information from other companies?"

The other major category of problems is situations in which you want to improve something. You don't really have a contradiction. What you have is a current situation, but you want to make it better. Maybe you want to make it better at what it already does. Maybe you want to keep what it already but make it faster, or make it cheaper, or make it have less impact on the environment. And there again, there's a whole set of TRIZ databases called The Patterns of Evolution that tell you how technologies have changed over time. And that the most predictable thing that's going to happen is to continue to follow those patterns. Then you have a choice. You either can follow the predicted pattern

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but do it sooner than one of your competitors. You can follow the predicted pattern, but do it in a different way. Or you can intentionally say, "You know, this is the predicted pattern and we've got six competitors, so the chances are they're all going to follow this pattern. Let's take a 30 degree left-hand bend and follow a different pattern so that we get what the customers need by a completely different method, and the competitors will never understand what we're doing.

The three major steps in TRIZ are the initial analysis, if I have a contradiction, going and digging into that data and if I have a need for improvement using the Evolution system, digging into that database. Then the next step is implementation. How do I take everything I've learned and make it real? Don't be at all surprised if this little road map loops back on itself, because as you're doing the implementation, you run into new problems. The label on my flow chart says, "Solution causes new problems." And everybody looks there and says, "You got a t-shirt that says that?" Of course – we've all been there, right? Solution causes new problems. So that's four steps with a loop. Is that okay?

Joe: That's fine. Where do you find these databases at?

Ellen: Well, the good news is that the initial TRIZ research was started in the former Soviet Union, and the guy whose books have been most widely published in English and who headed up the research for many years was named Genrich Altshuller, or Henry Altshuller. Altshuller was dedicated to make what he had learned – by the way; he had 300 people in the research at one point, or another, so it's not just him. But his is the name you'll find. He tried to be sure that things got published extremely widely and were

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extremely, freely available. So, there are online databases. There are websites. There are plain old books. So the information is very widely available. You mentioned that I was the editor of the TRIZ Journal. Actually that was from '96 to about 2006. Another company operated it until 2010 and then there were some business changes. And all the good news is the TRIZ Journal is still available online. It doesn't have any new things since 2010, but, on the other hand, all the databases are still available there, and it's free. You can read a few obsolete ads while you're at it. That's TRIZ-journal.com.

Joe: Is this just for products and for engineers, or is TRIZ – we kind of joked around a little bit that it would make a marketer understand engineering better or whatever – but can it be used in services?

Ellen: Oh, absolutely - in services and all forms of business in general. Because, really, what are you trying to do? You've got a customer who has a problem, and you invent a service because you're helping somebody do something they need to do. So, whether that service is catering the Christmas lunch that just took place in my conference room when I was getting on the phone with you, or whether the service is getting someone from a hospital to a recovery center (my husband was helping with this morning). A service is helping somebody get something done. TRIZ helps you analyze the problem and then tell whether or not that problem has occurred in any other industry. Well, it's hard to think of things that are going on in health care that haven't already been solved in agriculture. Or things that are going on in logistics that haven't already been solved in – hey, they oldest logistics systems we have are the post office systems that go back to like the 1500s in Europe, right? They didn't do it overnight, but they did it. So we have huge, historical

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databases of services as well as processes.

Joe: What is the best way for someone to get started? Can I just jump into it and learn it on my own? Or do I really need help? How would you recommend it?

Ellen: Well, you're asking probably the wrong person for an impartial opinion. It depends on your learning style. There are books. There are websites. My suggestion would be: start with something free, like the website, and if you find that you need it explained in more detail, well you can buy a book. If the books aren't working for you, there are things like I have an online e-learning system that's a hybrid. You take the class online and then you and I discuss your homework. But there are also public classes given by several of the professional societies. There are lots of options. The single best thing to do is getting started. If you find you have too many questions, get in touch with whoever wrote the thing that's generating the questions. The other thing that I would suggest is: depending on where your listeners are, both the Altshuller Institute, which is kind of the U.S. TRIZ professional society, and the European TRIZ Association – they both have Q and A sections in their newsletters. So, get started. Learn something. If you still have questions, get in touch with local people. There are now 16 TRIZ discussion groups on LinkedIn and two on Google+. I'll admit that I have an allergy to Facebook, so I don't know what's going on there. But the LinkedIn ones, people write in questions all the time and other people help them.

Joe: One of the words I see associated with TRIZ is systematic innovation. Is it the same thing?

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Ellen: There are several consultants who have adopted the terminology, “systematic innovation,” meaning TRIZ plus some other stuff. So generally, it includes TRIZ but includes some other stuff. I spent a lot of my years in quality and using quality function deployment, and certainly I never teach TRIZ without including the idea of, “You have to understand your customer.” But I just call it QFD and TRIZ. So, if you see the term, “systematic innovation,” it usually means TRIZ plus some other fields. I do want to mention, by the way, when you asked about learning TRIZ for your U.S. listeners, there’s going to be a conference in July - I guess I should say 2014 in case people are listening to this later on – in Silicon Valley by the Systematic Innovation Society. And so that would be a wonderful opportunity because there would be more than 300 people talking about TRIZ and systematic innovation in the Silicon Valley. It will be hosted at San José State.

Joe: One of the other things that I think about when I think about TRIZ is, you’re always hearing this, “thinking out of the box.” A lot of solutions come from thinking in the box. Does TRIZ cover both areas, or could you say it’s more out-of-the-box thinking or more in-the-box thinking?

Ellen: I think it’s both. It’s definitely both and not either/or. A lot of times people will start out afraid to get outside the box. After all, the comfort zone is in that nice, warm box. And I recently had someone in a workshop say, “TRIZ taught me that I have a box.” She hadn’t even realize that she had been constraining the answers to her problems to stay inside the comfort zone until TRIZ taught her to ask questions about what’s outside the box. Very often when people use TRIZ, they will come up with answers that are indeed outside the

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box. Then they have to face the business challenge of, “Is this the right thing for our company? Is this the right thing for our customers? This is really terrific answer to the problem, but it requires new capital equipment and our company just isn’t going to do that.” Or, “This is a really terrific answer but our customers aren’t ready for it yet.” And so, the business answer might be, “Stay in the slightly bigger box. But, let’s put this answer aside and start working on how are we going to be able to do the outside-the-box thing a couple of years downstream? I find that happens very often that TRIZ creates the out-of-the-box answer. The business chooses not to do it, but at least they start building up their own reservoir of future invention. And, by the way, that happens on services just as much as on products. Especially the, “Our customers aren’t ready for this answer yet.”

Joe: So TRIZ is really, what I would say – it can be both an analytical kind of simplified finding root cause, but it can also be used when we’re looking at a solution, similar to design thinking. So it covers a pretty widespread area.

Ellen: TRIZ has been very broadly accepted in the design thinking community because, in a lot of cases, the design thinking includes that front-end of, “Who is my customer and what are my customers’ needs?” Then they come back with an idea that has contradictions in it. “My customer wants this thing to be easy to learn and comprehensive.” Okay. “My customers want this to be incredible robust, and weigh less than 14 oz.” Okay, now I need TRIZ to solve the detailed design problems, whether they are software design or hardware design or service design. The design thinking gives me the front-end and the questions. TRIZ gives me a lot of support on the detailed design side of it. TRIZ is being taught in some of the major design institutes right now in Milan, in Strasbourg, in France, in

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Pasadena, California – starting to root in the design communities.

Joe: Is there anything you would like to add about TRIZ that maybe I didn't ask?

Ellen: I'd like to go back to one that you did ask, which is to encourage the audience to get started. Don't worry about it. Ignore any past reputation. Learn a little bit; apply it to a problem in your field. If it's useful, learn a little more. I would encourage people to play with TRIZ. One of the questions people ask me sometimes in live seminars is, "What if I do it wrong?" And the wonderful thing is, this is not like a class on hazardous materials handling or something. This is creative thinking. If you do it wrong, you might get an uncreative idea instead of a creative idea. But it's still an idea! Be grateful! Go use it.

Joe: I think that's great advice. You know, we mentioned the System Innovation Conference coming up, and we mentioned your online learning course. Could you give me the name of your site and also mention anything that you have upcoming?

Ellen: The website is TRIZPQRGroup.com, and you'll find links there to some of the free reading that I mentioned, as well. The TRIZ community is quite sociable. I mentioned the meeting coming up in July in Silicon Valley. But since this is a global audience, I want to mention there is the Korean society meeting in July, the Japan society in September, the European TRIZ Association meeting in October, and the Ibero-American Association, which usually meets in Mexico, but occasionally as far south as Chile or Argentina, in November. So, the good news about talking about this early in the year is you can plan your budget. The best way to learn TRIZ is starting, and then the next best is taking your questions to

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people who've done it before. The TRIZ community is very helpful and very social. So, get started and plan to go to a meeting.

Joe: Is through your website the best way to contact you?

Ellen: The back page there's one of those little, "Contact us." And I'm happy to talk to people.

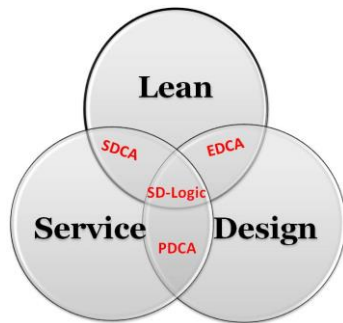
Joe: I would like to thank you very much. I think it was very entertaining conversation, and I look forward to hearing more about TRIZ and learning more myself about it. So thank you very much.

Ellen: Thank you, Joe. I look forward to hearing from your listeners.

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Joe Dager is president of Business901, a firm specializing in bringing the continuous improvement process to the sales and marketing arena. He takes his process thinking of over thirty years in marketing within a wide variety of industries and applies it through Lean Marketing and Lean Service Design.

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