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Podcast Transcription

Implementing Lean Marketing Systems

Uncertainty in your Decision Making

Guest was Eli Schragenheim noted

Theory of Constraints Author and Expert

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Eli Schragenheim has been part of the Theory of Constraints movement practically from the beginning. He started working with Dr. Goldratt as a programmer to program a game for adults that would teach them how to think over 25 years ago.

In the past 25 years, Eli Schragenheim has taught, spoken at conferences, and consulted in more than 15 countries, including the United States, Canada, India, China, and Japan. He has also developed software simulation tools especially designed to experience the thinking of TOC, and consultant with several application software companies to develop the right TOC functionality in their own packages. Mr. Schragenheim was a partner in the A. Y. Goldratt Institute and is now a Director of Goldratt schools.

He is the author of [Management Dilemmas: The Theory of Constraints Approach to Problem Identification and Solutions.](#) He recently collaborated with William Detmer and Wayne Patterson on the book [Supply Chain Management at Warp Speed: Integrating the System from End to End.](#) The new book contains much of the new development of TOC and operations.

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Joe Dager: Thanks, everyone for joining us. This is Joe Dager, host to the Business901 podcast. Participating in the program today is Eli Schragenheim and Eli is one of the earliest adaptors of the Theory of Constraints. Dr. Goldratt, Bill Dettmer and Eli are the three people that I most remember from 20 years ago. Eli, you have been part of this for a long time?

Eli Schragenheim: Oh, yes! I have joined the Goldratts very early on '85.

Joe: You have always specialized in the Drum-Buffer-Rope and wrote some of the original work that expanded on Dr. Goldratt's DBR theory with "Manufacturing At Warp Speed". You had a new book last year come out, on "Supply Chain Fulfillment at Warp Speed". Has those books differed, I mean Theory Constraints has really expanded; it's changed over the years a little bit, hasn't it?

Eli: Oh yes, indeed. And I would like also to change a little bit this kind of image that I have because while I had something to do of course with the production, planning and control and supply chain et cetera. My interest in TOC definitely surrounds the whole thing. What intrigues me in this kind of approach, rethinking management in total. This is what is still very special for me in the whole thing. Actually my very first book, I called it "Management Dilemmas", it did not really focus on manufacturing at all. It was more like identifying problems and devising solutions to them. I started working with Dr. Goldratt because I applied for the job of a programmer to program a game for adults that will teach them how to think. I created some simulations that are kind of business games around production mainly but did also worked on projects and distribution. This was my contribution as a programmer and then also as an educator because who will think on how to use them in class to deliver ideas. So this again, what hook me into it is how do we convince people about things and what kind of experience, even virtual experience, can we give them that we will convince them about which way to go.

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Joe: Most of us think about TOC from the standpoint of a bottleneck and constraint type of thought. We dive into it a little deeper and we realize that there is a whole other area of focusing and thinking processes. That has been really one of the best things that has grown out of TOC, is it not?

Eli: When TOC sort of started around '85, is the kind of development from the older O-P-T or OPT software, there were already some ingredients of the thinking processes. But then also came some kind of philosophy which I would say is the Five Focusing Steps and it took me many years to look for what is the synergy between the two. Eli Goldratt went on to develop the thinking processes, I believe around 1991 and started to redevelop them again and pushed them quite a lot. At the time he pushed aside the Five Focusing Steps which, at the time, I saw as a mistake. There will be always some kind of synergy between them. Then he came back a little bit later to it. Throughout the whole time there was development. Throughout the two chapters that I wrote for the TOC handbook I really like to put a finger on the specific development in the area of production planning. So it went side-by-side with the thinking processes with other techniques and right now in the last years "Strategy and Tactic Tree", eventually everything will come to something that is very united. I'm not sure we already found how to unite everything but they need to be united. The thinking processes is a very important thing but not on its own, at least this is my thinking.

Joe: Not on its own. You mean not using it outside of what context?

Eli: Well, you can use it of course. Look, on paper I can claim almost everything. So I can claim that every person is a clever person. This is a claim on paper. It could look very good. Eventually when you are faced with this kind of claim you need to translate it into a reality. So I assume at first you will get something to substantiate it if you look on yourself and I look on

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your picture but then maybe you will remember some other people and there might be some. And then you ask yourself, if this is so, what is the cause? In a way we need to look into reality in more than one way. Logic is extremely important. However, what I really like in TOC is that intuition has its own importance. Both are not totally secure which means there are question marks both on the logic, if I can put something very logical but it could be for whatever reason, it does not apply in reality. So we need to ask ourselves why, there is some kind of intuition about that it is a little bit vague but still quite important.

With all of this we need to know how to focus and how to make decisions and because of this I think we need more than one thing in order to be really good in what we are doing. So it is great to do thinking processes analogies but you bring into the table something else, some generalization from other things that you have seen elsewhere. So how do we match up those? How do we match the term constraint with a Thinking Process and how do you take the Thinking Process and look into the future and to strategy. How do you handle uncertainty for instance? By the way something is little bit missing in the thinking processes is how do you handle something a cause that is not a full cause, it is let us say 80% cause.

Joe: So are you saying how do you handle uncertainty with the thinking processes?

Eli: You don't have a very, very good way how to handle it. You can say sometimes. Once you say sometimes, you already said well, probably it is not always. You might say that there is insufficiency. This part of the basic terminology in the thinking process is that there is insufficiency. If most of what they are claiming is some kind of insufficiency because it depends on some things that I don't know and even not sure whether it exists in this reality yes or no. This is the impact of uncertainty. It is not a very practical way to handle uncertainty. Then you need to look a

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little bit really into DBR and CCPM and then you can see yes. But somehow TOC did introduce some structured ways to handle some sort of uncertainty. The whole question about how to handle uncertainty is for me quite a big challenge to come up with something even better than what we have now. I think TOC had contributed quite a lot to it. But still it is a big, a very big topic that we need much better to understand.

Joe: I mean business is really based on a lot of uncertainties, especially when we think about forecasting. By the way, I loved your section on forecasting because forecasting was never meant to be a number but that's how we think of it.

Eli: Yes, which is what troubles me. The vast majority of the managers do not really understand the nature of uncertainty. So they do not understand this tool that some mathematician and statistician came up with. They were thinking that people understand the basic assumptions behind it.

Joe: Can you explain for someone that hasn't read that chapter about uncertainty and applying uncertainty to a forecast?

Eli: Forecasting tries to give me some information. Let us say partial information about the huge question about what will happen tomorrow. How much will I sell tomorrow? How much work will I be able to finish tomorrow or whatever? Which means we are not prophets, we do not know what will happen tomorrow, period. We don't know that we do not know anything, anything might happen and does it have the same weight? If my way from my home to the airport, something that they do pretty often, let us say on average takes two minutes. OK but they need to make a decision about when I go out of home to go to the airport to take a flight. Could it be 10 hours? Well, let me tell you that this would be not just surprise; this would be up in the news.

Which means it is probably not impossible but quite improbable. This gives us some kind of a clue. I can say something about how

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long will it take the way to the airport like. I might say how much we sell next week. Well I cannot tell you something precise but I can tell you something that is more than nothing. And this is the key.

In order to know what the partial information is we need at least, and this is the most minimal mathematical requirement to do. Anything about it we need at least two things. We need something, call it an average, a central, something in the middle. Give me something that gives me an indication how much far away from this middle it could happen. And this eventually is coming from forecasting.

In forecasting in order to deliver this very partial information there is another assumption that says we basically believe that tomorrow will not be much different than today and the day before it. So we look into the past in order to predict the future.

We cannot really predict the future. We can predict some reasonable range of the future, and this is what we need to make any decision. This is hard to forecasting. Forecasting is an unbelievably to my mind important tool for managers, but again they need to understand what does it mean and what does it contain and how wrong could it be.

I don't know how wrong because they don't like to say how wrong about forecast, which never intended to give you anything that precise. So what do you mean by wrong. But it could tell you whether you can have a narrow, a range or sorry you have quite a wide range, so make up your mind what you are going to do with it.

So I think it is very valuable information that is really required for daily decision making and I am sorry to say that a vast majority of the people do not understand it.

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Joe: That's the logical side of it. The intuition as a business manager, how does he go about justifying his intuition to himself?

Eli: Well intuition probably is the word to the uncertainty, is also a word to what I like to call the reasonable range. Because of this intuition many times leads you to the right thing. But the intuition as such has a huge disadvantage. Intuition is lost when there is a real change, when tomorrow is definitely not the same as today. So if I take a flight, let us say that I go to St. Petersburg in Russia. Well, it looks like that the transport, the language, the behavior of people are all different. Because of this suddenly I realize that I lost my intuition.

There is another huge disadvantage of intuition which is, it is not a good communication line. Goldratt likes to make a point of this. Which means as long as I feel something I cannot deliver to others this kind of feeling. Which means that while people are aware of uncertainty, each one of them is taking their own decision based on intuition? There is no communication, the communication is pretty much lost and there is huge amount of misunderstanding around the people who are supposed to do something with a decision around forecasting or something of that sort.

Joe: One of the points that you have made before is making decisions based under severe uncertainty. The first thing that popped out of me with that line was the fact that under stress we follow our intuition, don't we?

Eli: Probably yes and in a way we should but I think we also need to put our logic as a control. Normally I would guess that we act based on intuition or even emotion but then luckily we have also some logic that is kind of guards to prevent us from doing major mistakes. But uncertainty is difficult, because it is difficult even on the intuitive side, certainly on the emotional side to deal with some things that you don't know. Because you don't know

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what will happen and from where and so you need some kind of guidelines from logic to guide you eventually, your emotion led decisions.

Joe: If you are applying logic trees and the TOC thinking tools, you would make a better decision based on that. One of my considerations is the time that you invest in developing one; can you really do that when you are uncertain about things? Don't you get lost in the process a little bit?

Eli: Well, it depends a little bit about guidance. In articles that I wrote, I came out with a kind of definition of what I call the reasonable range. There is a statistical tool that is sort of similar to it; somehow the name escapes me right now. But for me, reasonable range is based on intuition which means it is the worst and the best possible results. When you need to make your decision, what I think you should do, you look on the two extremes. They are not full extremes as unreasonable. But within the reasonable that is extremes for pessimistic and optimistic, and you try to go out of this. If this happens, what will be the damage, what can I do about it?

So eventually you have a kind of two alternative lines of action and then you are saying based on what I went through, what is the least damaging way. This is what you will do. So you buffer yourself from the other side that is much more damaging.

Joe: So when you are making a decision, under let's say uncertainty, you are going to take more the path of minimizing risk.

Eli: Minimizing damage may be you meant the same, but risk some people might find it a little bit different. What I am saying really is minimizing damage. A situation with uncertainty is that it causes damage, and you like to minimize the damage. I see we need to do it. By the way when I wrote to you I didn't really mean severe uncertainty because severe uncertainty really goes

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to something like I don't know, you need an operation, would you go or not go, and something of that sort. This a little bit that frightens me because, usually this is very, very high risk but with very, very small chance.

This is exactly where from my own point of view I raise my hands I don't know how to decide, each one will have to decide for himself. For me the problem is, let me call it in a kind of a funny name, common unexpected uncertainty. Which is a vast majority of uncertainties that we are dealing with every day?

Organizations are dealing with, how many sales per day or per week? How many people have showed up to work? How many complaints were received?

All those kind of fluctuating things are much easier to handle than the really, really, really big decisions that are really life and death kind of decisions. Funny enough, the whole thing about dealing with common unexpected uncertainty is not very well established. So very lately books by Nassim Taleb ['The Black Swan'](#) and things like these refer a little bit to it. Taleb came from Wall Street and his daily uncertainty is definitely different than mine or the reality of most of the managers. But he did point out to this kind of a misunderstanding of the nature of uncertainty I think he did it very well.

Joe: We think of uncertainty as not a day-to-day thing but what you are saying the important parts of managing uncertainty is the day to day?

Eli: This is where TOC have introduced the concept of a buffer. The buffer is really a protector on one side of the reasonable range, against the damage of the other side, by you willing to pay the price of the buffer or understand that you should pay the price of that buffer in order to protect yourself from the other side. But it does something more, because you put the buffer in a very visible format. It is part of your planning is that there is a

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buffer. So you recognize the existence of uncertainty in a very clear way. Look Joe, look on something like a budget. How much of the budget is really net safety reserve? In some of the good budgeting scenes they put maybe 5% reserves.

I think this is a joke. What do you want to say that you know exactly how much money is required to do all these operations that a certain organization or a department needs to do in a full year? And this is 5%. So clearly how much things will really cost. It looks to me total misunderstanding of the nature of a planning in a world of reality of some certainty. Of the daily and common and expected uncertainty, and I really do not mean here huge disasters but normal disasters.

Joe: Buffers don't apply just to inventory, it applies to life. A simple example in my mind is when you are at a grocery store with four or five check-out lanes. Two or three of them are empty and when they see people backing up in one of the check-out lanes a manager comes from behind a counter and opens another lane up. His buffer was...when needed, he had the resource to draw upon to fulfill the needs of his customers.

Eli: Absolutely. This is very good example.

Joe: And the budget is...

Eli: But I have seen it in organizations in which this could apply something much more doable in the budget. Instead of fixing it for a whole year, and in order that to prepare a budget for a whole year you need to start to do it about half a year, even before that. Which really makes a joke out of the whole budgeting thing? Really, I have seen an organization not too large. And in July-August is totally dedicated on all middle-level management to prepare for next year's budget. I mean, to guzzle all the numbers, as you say, is the start with the current level of expenses and then trying to speculate. But, then all becomes a game because, I will anyway, will accelerate on everything

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because I need the buffer, but I'm not allowed even to use this word. So I just hide it from the... These are my best estimations... So it's a little bit crazy.

Joe: Outside of budgeting, because I don't want to dwell on that, you have to develop these buffers throughout your whole business a little bit then.

Eli: Absolutely, Absolutely. You need to take the logic of DBF, and CPM and start to look on sales and marketing, and back office, and on almost everything. Any kind of planning needs to have buffers and needs execution. You need to look onto consumption of the buffers. I truly believe this is doable but we have a lot still to do.

Joe: When I'm sitting here thinking of the buffers, I think, you move back to that common point where you reduce variants or uncertainty, and you replenish that point or that's really where you're buffer stock goes. Am I thinking incorrectly there or?

Eli: You pull it into your supply chain. When they want something, they want it now. In order to have it now, you must have stock frozen. So, what you see sales keep a certain buffer of stock in the system. And keep this buffer of stock. Now when I say keep this buffer of stock, it means if someone is drawn to your needs and they need now as fast as possible to replenish them. So, replenishment actually is the keeper of the buffer.

Joe: Is uncertainty the same as variants? The variants in your decision making process or variants in your management, can I correlate that uncertainty a little bit?

Eli: OK, yes, because eventually, variants are the source of uncertainty. I think when people look on variants, they look on data and they say by how much the data fluctuates. You look at the sales every day, so selling Monday how many sales, how are they on Tuesday, Wednesday, Saturday, etc. So, you look on the

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ups and downs of the data. I look on the uncertainty something that is threatening because here I am the manager, or the owner, and every item that they put in stock cost me money. It is risky in a way. And because of this uncertainty, the mere fact that it does fluctuate, is a strength to me. They need to face the stretch, so I need to make up my mind how do I manage, well this stretch. So it leads me to certain decisions that I make.

Within the decision, of course, how many variants exist is of course, quite relevant, but variants are relevant when I know what decision you are now contemplating. Let me give you an example. OK?

On one hand suppose I own a shop. Somehow, I need to know how much of my money I have put in inventory in the shop, total inventory in the shop. If I look on the changes in this total inventory in my shop day-by-day, the variants are... I don't know, small, but not very large. But, when they look on one particular item, the variants are very large.

Now, and because of this decision about an item, a decision about the total, even though of course, a link to each other...pretty much different. So you need to put into yourself to understand this nature of uncertainty. Mainly, what is the damage that is coming up for it?

Look, the whole question, "What is the damage" is a very big question. What is a damage of the shortage? Could be, you lost one sale or two possible sales. This is, could be one damage. However, is it the whole damage, while this is a huge question mark because is your reputation harmed because of it? Will the disappointing customer tell other customers that maybe they should not come into your shop?

This is something that you cannot measure by variants. Variants look very mathematical. It is an outcome of calculations. Uncertainty for me something a little bit more generic, but also a

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little bit more fancy because some of it, sorry we will never know the real numbers. We never know the real numbers, maybe we need to understand the mathematics, but maybe our decision cannot be truly mathematical in this sense. We cannot rely on mathematics to solve, really solve those kind of problems in our lives. Maybe guide us to some kind of a good-enough solution is what we try to do. But in itself, they cannot solve.

If I had something against variance, it's because it looks precise. It looks like the outcome of a calculation of some real numbers. Then sometimes in life, we simply don't have the numbers.

Joe: How do we go about justifying that decision then? I mean are we going to... is that where, to you, the thinking process comes back in, is using some of the trees...?

Eli: You can explain it eventually with some trees, but actually, I think part of the genius idea of buffer management coming now in and says, look; at first you put the buffers that this is not more than a guess. But then you check the buffer. But what do you mean you check the buffer? Because you don't check the absolute value of the buffer, but you do check whether the buffer is about right, or is the buffer definitely... not definitely, it might be not right. And this is already quite a lot. Which means, I put a buffer and then I'm getting signal from reality that the buffer is too long? How do I get the signal?

When I look on the colors of the buffer, in the vast majority of the time, it is green, sometimes yellow. It never went into be red in a quite long time. And I'm saying, well, I'm getting a clearly good signal so that I don't need such a buffer, I can reduce it.

But if it were... quite a substantial amount of time it was in the red, hey, the buffer is not enough. By how much it's not enough? Oh, sorry, I cannot tell you. So increase it and then check again, this is the best you can.

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Joe: If I'm fighting fires all the time, I need to add some more water, OK?

Eli: Yes, because fighting fires is very bad for business. This is not known to many people that if all the time you fight fires, which means all the time you are on the verge of getting big damage. Statistics will say some of it will turn to be real damage. Why do you want this huge damage? Put up this kind of insurance if you want, kind of a buffer, pay the price for it. Then you are so much more stable. Not 100 percent stable, but much more stable.

Joe: We've done a lot of work in Kanban, where it's more of a personal Kanban, or managing a work-in-process using Kanban where we'll put the limits on what you're actually working on. This is an extension from software development, the agile methods and things being used right now. You do that, and I like the idea of red, yellow, green or red, yellow, orange; what everybody is going to use there to be able to signify where you're at and what you're doing, because really it's... the doing part of most of the things isn't as important as managing the queue or managing the to-do in front of it; managing what you would say your buffer.

Managing the buffer is the key to really managing uncertainty, managing variability, and managing your workflow.

Eli: Yes, exactly, this is what I think it is. This is kind of an additional idea. Because between Kanban and drum-buffer-rope flow, there are two systems that tried to achieve the same result, and they're doing a little bit differently. We might say drum-buffer-rope is a little bit better. But OK, maybe is and maybe not. Buffer management I think is another idea that really says, with all due respect, you can reduce variance in your walk up to a point, and you cannot reduce it more than that. You do have other as a sort of uncertainty in which you do not control

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because it comes from your market or from suppliers, from people in general, and there is a limit how much you can reduce it.

So what you can do, how do you leave... you can do by monitoring the buffers, is that you need to put anyway. So you put the buffers part of your planning, and you manage your priorities based on the consumption of the buffer. This looks to me as a really far-reaching idea.

I'm pretty certain we are just at the beginning of really utilizing it truly well. In TOC, we did it, I've seen very good job in the shop floor in production and in projects. But we can do it in our life; we can do it in huge amount of things.

The one I'm saying, if I'm clear in my mind what is the uncertainty and what are my buffers, my next thing to do is to fix my red line. At what point I know that something is not OK and I need to react? And drawing these red lines, I think this is a very important message for every kind of manager, actually to every person.

Joe: In generalities, when you relate this to TOC, Theory of Constraints, is this something totally different than TOC? Is it something that is still tied to TOC, Eli? Where do you think this is developing?

Eli: For me, it's part of the overall TOCs that have not been fully developed yet. Which means, sorry, I might call it TOC-inspired, but this is for me what is TOC, because I don't think that TOC right now is something that I don't know even the TOC handbook is only topics. It's still the beginning. These are the basic ideas in which we suddenly learn that we need to make some kind of a change, expand our mind. So TOC is not something that I can already put up a limit to say this is TOC, what is outside is not TOC.

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Joe: If I'm looking at the TOC handbook; it was kind of a current-state map.

Eli: OK, it could be. Funny enough for, I think, to check this, I haven't seen it yet. The whole book, I mean. But yes, I really agree that this is probably the closest to the current state. But it's expanding and going everywhere, and the governments at least going very far ahead all the time. And I would like very much that many other people, will also start to develop more and more kind of additions in which we take the basic concept and we put them somewhere else and we re-develop them.

Joe: It always seem such a shame that the popularity of [The Goal](#) and the branding that happened to theory constraints because of it. That it was always thought of a bottle-neck instead of something to handle a constraint. I thought it was interesting in your chapters where you wrote that it was called a bottle-neck because constraint wasn't really a word they were using back then. One of the things that is difficult for people outside of the field the TOC world is, I think, is learning the thinking process and the tools. Without good direction it seems it's difficult to learn from a book even though there's been quite extensive work done in books. I think it's tough to do that. Do you agree with that statement?

Eli: Yes I agree so far it's pretty tough. It might also say that maybe we should also come back to the tools themselves and maybe look how to simply file them to some degree or how to verbalize it better. The thinking processes are not easy to learn - not even in class. But it also seems to me with the new appreciation I have for the thinking processes that still I think I am not sure what, but there is still something in it that is a little bit too... I don't want how to say complicated I don't think it's the right word but something of the sort. It's not friendly. OK?

Joe: Cumbersome would be my word.

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Eli: Yes, yes, yes. Good. Thank You. Yes it does fit. It is a little bit cumbersome and we need to find ways to simplify it to some degree and we need also people to educate themselves how to look into it and how to judge it. Because just because you succeeded to put the whole tree does not really mean that all that is written in the true is really a very good reflection of the cause and effect in reality.

But this is a struggle for us all the time. Do we understand the cause and effect in reality? And I think we should always try to understand it better.

Joe: Everybody's perception is somewhat different. That's what makes us unique, of course. This may be kind of a real big picture type look at it. We all arrive at different decisions and when I look at the logic side, it is what grounds us and enables us to make a common decision.

Eli: Yes this would be very good to make a common decision. Still I believe that our decision, how much more oriented by emotion. But, we do have our logic as a control. This control is extremely important. And I think this control that eventually enables us to come to a common decision. Because we realize that we need to come to a common decision and there is some kind of a realizing each other, even emotions, even feelings, and then come up to something that is good enough. The concept of the good enough is actually very important. Because I think this is where we differ so much from the academia that tries really to go into a mathematical term of optimizing.

This already is realization that there is a lot of uncertainty so we cannot optimize within the noise. Because of this we have things that are good enough. Maybe on a certain inventory label I would say 100 and you will say 90 and so I will agree to 90 just because 90 is good enough and who knows the difference between 90 and 100 anyway.

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Joe: I think those were great points. I'm sitting here just the tidbits that I've gotten out of this podcast Eli has been great and the different things that you've added. Is there something that you would like to add? I've come to the conclusion that this podcast is good enough right now. Is there something you'd like to add that maybe I didn't ask?

Eli: Well, I would like to recommend people to read those two chapters. Maybe not so much because of just the content or interest in the chart flow but because I tried to give some kind of substantiation to the development of ideas and if you understand that maybe you yourself or any reader could generalize it to something different and then I will be really happy.

Joe: I would like to finish up by saying thank you very much.

Eli: Thank you Joe. Thank you very much.

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What others say: *In the past 20 years, Joe and I have collaborated on many difficult issues. Joe's ability to combine his expertise with "out of the box" thinking is unsurpassed. He has always delivered quickly, cost effectively and with ingenuity. A brilliant mind that is always a pleasure to work with." James R.*

Joe Dager is President of Business901, a progressive company providing direction in areas **such as Lean Marketing, Product Marketing, Product Launches and Re-Launches. As a Lean Six Sigma Black Belt**, Business901 provides and implements marketing, project and performance planning methodologies in small businesses. The simplicity of a single flexible model will create clarity for your staff and as a result better execution. My goal is to allow you spend your time on the **need versus the plan.**

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