



Transcript for the WLEI Podcast:

What Fuels the Success of Automakers in Today's Age of Disruption: A WLEI Podcast with Jim Womack and Josh Howell

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In January 2022 it was reported Toyota Motor became the first manufacturer from outside the United States to sell the most cars in this country for the year before. While this news may very well prove to be transient, it certainly raises key issues about what has accounted for the company's success. What salient takeaways we can, well, takeaway for others? What aspects of its production system, which is foundational for lean, have supported its success? How can companies productively balance the need to develop products that dazzle consumers with the need to simultaneously develop the brilliant processes that produce these coveted items? Join host Tom Ehrenfeld on this episode of the WLEI podcast for a conversation with LEI founder Jim Womack and LEI President Josh Howell about Toyota, Tesla, and an inquiry into lean's value in today's time of discontinuity.

Tom Ehrenfeld:

Welcome to the WLEI podcast. Welcome Jim Womack, welcome Josh Howell. Hi guys.

Josh Howell:

Hey Tom.

Tom:

Today we have a great opportunity to discuss some lean themes. The news that prompts this conversation is the article that Toyota has topped General Motors in US car sales in 2021, the first for a foreign automaker. This is noteworthy but probably temporary. It really just creates a nice opportunity to explore some deeper takeaways. One really intriguing question is whether a lean enterprise can be an industry disruptor in an age of technical discontinuity. What enduring qualities and advantages come with the pursuit of lean and the following of it in a disciplined manner consistently over time; and what might be learned from a comparison of Toyota and say Tesla? The point is not to beat up on Tesla, which has been wildly successful, but to try to parse out what's worked for both of them and what challenges lie ahead for each. Once again, what can we learn from them. Jim. Go ahead.

Josh Howell:

Are you saying beating up on Tesla has been wildly successful, or Tesla has been wildly successful, or both I guess?

Tom:

I meant that Tesla has been wildly successful and a lot of predictions of their failure have been premature if untrue. Jim, how would you, let's jump off from the news Toyota has had a very successful year, so has Tesla. What do you see when you look at the performance and current state of both companies and their immediate challenges?

Jim Womack:

Well, it's interesting that Toyota for 50 years was disrupting an industry, not through products but through a different way to produce, distribute those products, manage suppliers and so forth. It's very interesting. It's not what we think of as disruption. In this age of disruption people are almost always talking about products, whether that's hardware or software or both. Toyota had a long history of disrupting through creating better processes behind the products.

Josh Howell:

Jim, just curious to that statement. How do you see then the role that the Prius played or even let's say Lexus?

Jim Womack:

Well, neither of those were normal Toyota activities. The great growth of the Toyota company was not Prius, not Lexus, but doing a mass market vehicles in a way that their costs were lower, their quality was higher, their lead times were shorter and so forth. I just say that as a background because people look now at Toyota and many see this very slow-moving solid business and say, "Well, gosh, in an age of disruption that's a very vulnerable thing to be. Good grief, this is the slow-moving, plodding creature out there in the middle of this competitive environment. This is not good." My point simply was that for 50 years Toyota was able to disrupt an entire global industry by building a better process without necessarily building a more interesting product. Let's see, Prius, which was launched in Japan in '97, was actually envisioned by Toyota at the beginning of the '90s.

Jim Womack:

By the way, it took them seven years to get a salable vehicle that they thought would speak to an environmental market that they thought was going to be a growth market. They also thought that smart young people would want to work for a company that was, for a change, building interesting products. The Prius was born in the dot com bubble of 1990 when suddenly all kinds of electronics companies were the place to be. Toyota was shocked that for the first time young people graduating from university, engineers, said, "Gosh, Toyota's boring. Why would I come over there?" That was a response to a time. It was not their core doctrine though. Lexus was simply a move up into the luxury segment. A very logical thing that historically almost all car companies had done. They just didn't have the money to do it until 1990.

Jim Womack:

The disruptive power of the company, which we have tried to share with the whole world by trying to explain the methods they used, was inherently about process rather than product. It's also very interesting that Toyota's basic stance on technology was to be a follower rather than a leader, and to do it better. They would let someone else go dashing off for example, and we'll get to this in a minute with electric cars, and then they would take the time to think through the best way to do it. Then they could come up with a product that was comparable, which might be better in terms of quality, in terms of well cost, in terms of delivering reliability. That's been their stance for a long time. Then we come to an age where there truly has been a lot of disruption driven by technology and by new entrant companies, put the two together, and they do go together on this scale of disruption.

Jim Womack:

Disruption in this case refers to not just the electrification, but it's also the autonomy and possibly we'll see the vehicle sharing. Toyota, by the way, has a big stake in Uber really as an experiment rather than to make money. Then probably the most interesting thing in terms of staying in business is that modern day vehicles both generate enormous amounts of data and receive enormous amounts of data. What do you do with those data as a competitive proposition? Perhaps it can all be monetized, perhaps that's the real money in the car business. Well, who knows? But that's a lot on the table of question marks of what to do about electrification, what to do about autonomy, what to do about asset sharing, what to do about what I call hyperconnectivity. As a business wanting to stay in business, Toyota wants to stay in business. Like any other business they would like to not just survive but prosper. What is the stance of a lean enterprise in that point in time? That's background.

Tom:

Yeah. I was just going to ask a background question which is this presumption that organizational capability and technological excitement are somehow different paths. I think over the long term they converge, meaning that companies that mindfully develop organizational capability for learning and growth will find that the products they deliver to their customers, the customers value, will eventually manifest that care. I don't want to halt your thinking, but maybe Josh, what from your experience have you learned about the value of organizations that mindfully develop their own people and how that plays out in what they're able to put into the hands of customers?

Josh Howell:

Yeah, I guess, on the topic of capability, I mean, it probably helps to be specific which capabilities it is that we're referring to. I mean, in Toyota's case, of course Jim and others that have followed have helped us recognize the management and the operational capability in that company. With Tesla, we can appreciate the capability that they've engendered around technology, product, even some innovations in how they handle the customer experience. I mean, even recently on the capability that Toyota, or that Tesla rather is focused on maintaining and leveraging. We've read about how they've weathered the chip shortage issue

perhaps more effectively than their counterparts due to the fact that they've kept, for the longest time they were making their own chips. When they were no longer able to do that, to maintain their own supply at an adequate level, they were able to engage with other chip makers but they had the know-how about chip manufacturing, chip design in-house that they could apply to making these non-standard chips work in their vehicles to modify those.

Josh Howell:

I certainly think capability, however an organization comes about it, either through developing it in some systematic way internally or by purchasing it through who we hire, I guess, or who we establish as suppliers and partners. Capability certainly is that issue here. Yeah.

Tom:

Jim, just to pull in this thread. I mean, lean to me is about organizational learning: formal, intentional reflection that builds on experience and leads to continuous improvement. Can you just take us through some meaningful historical incidents with Toyota, basically in terms of how it's responded to past crises and prepared itself for moments like these?

Jim Womack:

Well, yes, let's do that, but let me just back up one second. The nature of the moment is that the new entrants feel, and I think with some justification, that they have to go fast. That speed is the whole thing. I'm not talking about speed of getting a brilliant refined product to market. I'm talking speed about least getting to launch where you can do the initial public offering that then funds the rest of the buildout. Therefore, there's no time to do all of the things that Toyota would do. You hire some young people, you train them up. Toyota always says you can't build good cars before you build good people, before you build good managers. Hey, there's no time. There is no time. You have to go fast. What we're seeing out of the market absolutely says that this is the way investors look at new entrants with new technologies. They want to see something fast.

Jim Womack:

That's totally the opposite of the way Toyota would think about building a business. I would predict that all of the fast new entrants will now spend quite a lot of time backfilling, retrofitting, reworking the processes that they just cobbled together. Think of any of these new, and there are a dozen of these new electric car companies out there. They all look pretty much the same in terms of they've got a heroic leader, the heroic leader's got the plan, the team has signed up to execute on the plan. We're not going to talk about the plan, we're going to execute on the plan. Above all we're going to go fast. We're going to work all night. We're going to sleep at the end of the line in our sleeping bags and so forth. It's amazing actually you can do this at all.

Jim Womack:

That you hire a bunch of people who have come from all kinds of places. Never worked together, no company culture, no processes, and say, "Okay, you folks quickly develop and

launch a vehicle." This is the exact opposite of anything that Toyota would ever do. By the way, they didn't do that way back when, they didn't do it back in the '40s, it took them a long time to get going. It's just a different situation and it produces in the short term very different perceptions of how fast people really are and we'll see.

Tom:

But one quick question, and sorry to leap in, but the one, I think, misconception is that there's consequences. That there's a trade-off in the quality of the product that you put in the hands of customers, and a company like Tesla has thrilled its users. There's just deep, enormous currency. People are thrilled with what they're making and they don't care how they make it. It doesn't matter to them. It doesn't matter to the customers. Is there a necessary trade off behind racing, going at Elon's speed to produce these vehicles that people love?

Jim Womack:

Hang on. That in a new situation with new entrants, new technology, there is in the world a group of people who don't even know who they are, and we find out who they are after the fact called early adopters. These are the folks who are totally focused on the new performance that a product can offer. We've gone through this with cell phones. We've gone through this with all kinds of software that you can use on your PC. We've gone through this now with motor vehicles. The initial early buyers are focused on this performance that's not possible from preexisting products. You can't get to 50 miles an hour in three seconds in any practical internal combustion engine car. There are just some simple physics involved there. Those people tend not to be very interested in, for example, are there squeaks or rattles? Does the screen go blank occasionally? Or do the window liners leak or whatever? Because that's not why they bought the vehicle.

Jim Womack:

By the way, it isn't just the performance that they're buying, it's the perception amongst others who might know them that they are part of the future, that they are forward-thinking, that they figured out something that other people haven't figured out. Gosh, having a car that doesn't have any squeaks is not part of that. Therefore that's going to happen. But wait a second, that great middle of the deployment curve, which is all the ordinary boring people. We're just talking about the boring middle, whoa, this thing's a daily driver for them and they want it to start, and they want it to run. They don't like squeaks, and they don't like leaks, and they don't like screens that go blank. That's a very different situation. I think that's an unavoidable situation for these new entrants that they will have to address the traditional quality metrics at some point.

Jim Womack:

Now, very interesting for Toyota which has said they will launch in mid '22 their first real volume battery electric vehicle. By the way, they did work with Tesla between 2012 and '14 to take a RAV4, called it the RAV4 E and they simply put under the bottom the battery packs that Tesla was using in the S to produce a few hundred electric Teslas. They did that to learn both

about Tesla, but also about electric vehicles, but that was never going to be a serious product. Now Toyota comes to market in mid '22 with the, what basically is a RAV4 electric. It's a crossover rather than a true SUV. But Toyota being Toyota, it needs to be perfect. It's a really interesting challenge. It has nothing to do with Tesla.

Jim Womack:

All of these new entrant electric vehicle companies are producing products with all kinds of things that are not really where they need to be. It's okay because the performance they're offering is just so startling and the image they give the customer is so satisfying. But Toyota doesn't get that slack. It's really interesting. Can they be the first to produce an electric vehicle? The batteries can't catch fire please. You can't break it for mysterious reasons out in the middle of nowhere. It can't have rattles and squeaks, that's not allowed either. So it's interesting. We'll see whether Toyota can do that.

Josh Howell:

It would be interesting to plot out the curve of the early adopters to the folks in the middle, to the resistors, and how that defines the customer base over time relative then to the operational capability that a startup, is developing. I guess so long as those two things are running at the same rate, perhaps it's okay. I mean, you want the whiz-bang thing for the early adopters, that's what they're looking for and Tesla provided that. When it got to the middle and some of these quality issues started to arise, that becomes increasingly a problem. Unless of course the operational capability is developing in parallel.

Jim Womack:

Also, just to say one other thing. Interesting that you get started with electric vehicles, high price almost seems to be a plus. That you've been getting government subsidies that bring down what appears to be a very high price to merely a high price. But that's something that is not bothersome. You can't say, "Okay, now we're with the Corolla segment and we're still going to have these quite pricey vehicles," because the buyer base can't actually afford that. Because it also is not consistent with what the person just wanting the daily driver wants. They're not willing to pay more for some features that are actually not very important to them. We'll see what happens. My prediction, which I make fearlessly because it's so obvious and it can't be wrong, I love predictions that can't be wrong, is that all of the electric new entrant players are going to spend the next 10 or 15 years trying to figure out how to get good at stuff Toyota's been good at for 30 or 40 years. Toyota has to think about how to balance the need to get with the new technological paradigms with these traditional values associated with their vehicles that they, I think, can't afford to sacrifice. So an interesting contest.

Josh Howell:

Sorry, Tom, just real quick, but one of the things that I often catch when it comes to Tesla customers on let's say social media would be posts of the latest update on their dashboard for like a Tetris game or something. It has nothing to do with the vehicle, but it is that fun thing. Those things are coming out all the time. I mean, there's light shows on the dashboard, and

even the headlights and taillights dancing to some Christmas tune during the holiday season. I mean, those are fun things. They're not about the core of what the purpose of the vehicle serves. But you do wonder if Toyota for example couldn't develop some capability to have fun on the periphery like that and do that stuff rapidly and just keep the attention of those folks that really are all about the technological advancements. I mean, the fun, the wow factor of a Tesla that the early adopters are mostly focused on. It's inconsequential, it doesn't put people's safety at risk or any of those things.

Jim Womack:

Well, here's the background. Years and years ago in Japan I had a pretty senior Toyota executive when I was doing an interview. I said, "You sure do seem to be grim around here." He said, "We win because we worry more than other people. By the way, smiling is muda." I thought, wow, this is a tough lot. I'm not sure they're going to be good at dashboard games.

Tom:

Explain muda.

Jim Womack:

You can hire some weirdo outsiders to put a little tint of fun in your vehicle. I think you could do that. It may not be part of the core culture, but you can probably do that.

Josh Howell:

Fair enough. Fair enough.

Tom:

Couple quick things, muda being waste, excessive. This actually raises a question, I'm going to throw this one back to Josh. There's almost this implied convergence. You have, on the one hand, a company with great technical expertise that's fueling the very appealing products to a possibly early adopter crowd and competing with a company that's just brilliant at developing robust processes. The underlying technology is, again, the capacity of the company to learn and develop problem solvers at every level. I just want to share that as an open-ended kind of question to you, Josh. What's your beliefs on it? The value of that? How do you think that relates?

Josh Howell:

Well, I guess, so we talked a little bit about this in preparation. Our framing here is the prototypical Toyota-like organization versus, so to speak, the Tesla-like organization. I think even this conversation points out the benefit of each, I mean, the strengths of each. I think where my mind goes is more in terms of what can we as lean thinkers and lean organizations learn from both organizations and incorporate into what we do so that we can be fast and appealing to those early adopters, which has tremendous value. I mean, just look at like stock

market evaluations. Also have that consistency of purpose in building out our organizational capability, developing problem solvers everywhere throughout the organization.

Josh Howell:

There's an organization that we've been interacting with for a number of years that it strikes me is not in the automotive industry, but that it strikes me as really trying to have it both ways. That's the organization down in Brazil known as CI&T. What I appreciate about there, I mean, they wrote a book called *Faster, Faster*. So the notion of being fast and early and ahead of the pack is definitely something that they're trying to do as a software service provider. But they also, in being fast they've developed, for example, a 90-day project cycle where you go through an entire development phase, and then some kind of A3 planning into execution with much iteration, fast iteration happening throughout that execution phase.

Josh Howell:

They speak to the value of that approach, but also the capability that was required to be able to use that approach and how continuing to use it further develops capability throughout the organization. I wonder if there aren't more organizations like a CI&T who are taking lessons from what they observe companies like Tesla doing, taking lessons from what they observe companies like Toyota doing and saying, "Well, we're not going to approach this as an either or dilemma. It's instead an and thing." I guess I see that as the pathway for us lean thinkers as we forge a path forward.

Tom:

Question, how does concurrent engineering, Jim let me ask you that. How does that translate specifically into what Josh is saying.

Jim Womack:

Well, let me take a step back, Tom, I'll get to right where you're there in just a second. Even at the problem-solving level there's some choices that probably many folks listening have had some experience with A3 probably perhaps fewer people with really rigorous hoshin planning. But the key there from a Toyota lean perspective is to spend a lot of time on the left side of the A3 and even up at the top making sure you really understand the situation. The problem is in that situation somewhere and then what is that problem? So that if you spend more time upfront as they say you go slow to go fast. I've tried that on some of these new entrant companies, tried that personally. Explained to them that you really ought to go slow to go fast. They say, "The one thing we don't have is time." That you're used to a clock speed that's just different from the clock reality of the current moment.

Jim Womack:

That's an interesting question. By the way, I don't have an answer, but it is really interesting that you're going to get a better result probably if you take enough time to fully understand the problem. But it may be that by the time you understand the problem, you're just completely lost in the rear view mirror in a competitive situation. So what do you do? Then let's take the

specific case of concurrent engineering at Toyota. That's concurrent engineering, not to be confused with simultaneous engineering. Simultaneous engineering is something totally different in which the people developing the next step in a development process can start work before the previous step is finalized because they understand each other so well and there's so much information shared that you can compress the steps and get to market quickly. That's one thing.

Jim Womack:

Concurrent engineering says we don't actually know what the technical solution is. Instead of very quickly saying, "Ah, time is of the essence. We've got to make a decision. We're going with this one." Then development is about proving that was the right decision. That has been typical of most of the new entrants in the car space in recent years. They picked a technology. They said, "Aha." They've done some work, they've done some thinking, but here it is, we don't have time to wait to reflect on this. We just got to go. A company like Toyota looks very slow-footed. Let me just take the case of the battery car that Toyota did the project with Tesla back in 2012, '14. I think they concluded two things. It was done at the Fremont Tesla Factory that had formally been the joint venture Toyota GM factory became the Tesla factory.

Jim Womack:

It's done right there, set up a little sideline to make a small number of these cars design them. What they concluded was A, "We're just not like Tesla at all. We're just not like Tesla. We can never work with these guys." But by the way, Toyota typically doesn't work on a same level with anybody else, they typically go it alone. That's a different issue. But they said, "Boy, these batteries stink. They're actually heavy, they're volatile. They got everything wrong with them and they're incredibly expensive." It is premature for Toyota to take a leap offering battery electric vehicles, particularly for the mass market. This is the Corolla mid-market, the RAV4 market, with the technology that is currently developed. So therefore we're going to take our time. Taking the time on the batteries has meant they have looked and looked and done a lot of work on solid state batteries trying to figure out how they could get them to work. There's a big, big, big performance leap there if you can do it.

Jim Womack:

But at the same time, they said, "Gee, we're going to keep working on fuel cells," because there's some kind of physics calculations that might lead you to think for the long-term that's actually a better approach. We're going to hope we don't have to go too fast. It's interesting that the solid state has not worked for Toyota or anyone else yet, it may very well soon. But last December, just a month ago, Toyota made a U-turn from basically driving with the parking brake engaged with regard to developing electric vehicles to a new campaign just out of the blue called 30 by '30, which is 30 completely new, totally new, electric vehicles all across the range of products by 2030. That's not because they actually think this is the correct long-term solution or the best long-term solution. It's because they acknowledge that the industry is just zooming away with everybody offering these vehicles. If they offer nothing as an alternative

saying, "Hey, we're just thinking about this. We're doing concurrent engineering." That it's just not going to work. They've got to do something.

Jim Womack:

That's how they wound up suddenly announcing 30 all-electric vehicles by 2030. I would say their heart isn't in it. I would say that, look, I don't have the inside secrets, but I think they wish this thing would go just a little slower so that there was a little more time to think through what the best technical approach is. Final thing and I'll be through, that the psychology of engineers runs against this go-slow thing. That engineers really love a design solution. Then development is again about proving, that was the right answer, and engineers love that. That's just comfortable and you're making trade-offs and doing all the kinds of things that engineers know how to do rather than just blue sky thinking about all these possible things, which feels very squishy and makes you nervous. There's some engineering culture out there as well that the software engineering culture is different from the hardware engineering culture. Toyota's historically been very much a hardware engineering business.

Josh Howell:

Well, I mean, as this plays out it'd be interesting to see what Toyota did discover while it was spending all that time on the left side of its A3 so to speak. What did they discover, and how's that going to manifest as they start releasing these products in 2022 and over the next eight years? How will they catch up to or perhaps race ahead of their competition? Because they did spend time on the left side through experiments with Tesla and other organizations.

Tom:

Can one of you guys actually define, articulate for our listeners, what you're referring to when you say spending time on the left side of the A3?

Josh Howell:

Sure, I can take that. A3, as I think many in the lean community would know, simply referring to a size of paper 11 by 17 roughly inches as measured here in the US. The insight that Toyota developed was that it's possible, and in fact arguably more effective, to put all the critical information needed to effectively solve a problem onto single sheet of paper. Typically that organization gets organized into a left side of the A3 or right side of the A3. The left side laying out what's known about the way things currently are, the problem that we're trying to solve, what we understand about the current state. Then the right side detailing what we intend to experiment with, some of the ideas we have, potential countermeasures if you will, and what our planned actions will be. We say the left side, it's the place where we capture what we're learning through the act of studying the way things currently are and seeking to understand well and frame well the problem that we're seeking to solve.

Tom:

Okay. Because all of these trends just lead me to wonder about the deep relevance of lean right now in our economy with a really fast metabolism, where a company like Tesla has been hugely

rewarded with a go fast to go fast mentality with a heroic hero who has created a vertically organized company that has thrived within chaos with heroic fixes and has frankly delighted customers and profited enormously. Whereas Toyota, and it's not a neat Toyota versus Tesla. It's using these two as we're just casting them as characters who embody differing values and approaches.

Tom:

The crazy thing is that Toyota was and is and remains disruptive, but I don't think it's perceived as that as much. We're seeing ways that there's this convergence of approaches, especially with 30 by '30 by Toyota. Help me out by parsing through this and articulating what are the most important lean principles that perhaps are being missed or obscured if one looks at the evidence of Tesla's exciting success and Toyota's enduring success as well. Forgive me if that's too open-ended, but I'm trying to pull together the different strands please.

Jim Womack:

Well, look, let's say that first off appearances are deceiving. All of the new entrants in the electric space have said they're going to go fast to go fast. That's true up to the point of the first producible vehicle and the public flotation of their stock, and then guess what? They go slow. It's pretty interesting. If you took a start to finish timeline for Tesla for new products, is it actually any different from Toyota? If you've looked at the media in the last 48 hours. Well, the famous Cybertruck, which was supposed to be a 2021 vehicle is now suddenly a 2023 vehicle, so it's really slipped two years from the original idea. Everything else that been done at Tesla except the derivative products, the Y and the X did not slip as much as the S and three. But the perception's really important, particularly in this hyper, I would say, overinflated investor market that you have to be quick to get something out that you can claim as a real vehicle.

Jim Womack:

Then there is the small problem left of how do we actually make this thing at volume with good enough quality, if even not very good quality. Part of this is just a mirage that the fast appear to be faster than they are. I think in the longer term the slow will turn out to be faster than they appear right now. Some of this will pass. It is simply a phase. That's not much reassurance to the diehard lean thinker. Thinking of my good friend, Jim Morgan, former chief engineer, buddy, leader at the Ford Motor Company and the most articulate explainer of lean product and process development. Who I think really does agonize a bit about these electric jackrabbits that go zooming off and make the old-fashioned development process as now perceived by Toyota to be irrelevant. Whereas in fact I think in the goodness of time it turns out that you actually can't go fast to go fast. You would be better off going slow to go fast. Which by the way you can do if you have an enormous amount of money in the bank, which by the way Toyota does and which by the way the new entrants to get started didn't. We'll see if this all evens out and levels up.

Josh Howell:

I think the perception can be a deceiving thing. We should also recognize to the extent that that's true with Toyota. I mean, I guess the experiment you referred to earlier that Toyota ran with Tesla to expose themselves experientially to a very different way of working and they drew whatever conclusions from that experience that they did. But we also hear from friends like Nigel Thurlow, who Toyota hired some number of years ago, who had deep experience in agile methodology coming out of the software world. They brought him in to learn from his experience and his know-how and experiment with this individual coming from a very different background and culture to see how those faster cycle-based approaches could jive, and enhance, and influence positively perhaps the more methodical A3-based approach that the company had developed and gotten such experience with.

Josh Howell:

I mean, I've even participated in conversations within lean community with certain notable figures in debate around the traditionally methodical approach of A3 versus something that often gets practiced more quickly like kata cycles. Which is better? Or even, which is Toyota more emphasizing these days? There are reports that Toyota itself spends less time on the thorough methodical A3 today than they once did, migrating towards something more quick that you might find in an agile methodology or a kata approach. Now, again, I don't think it's an either or situation, but a yes and thing. But in any case, these are interesting debates and discussions and developments that are the center of this conversation.

Tom:

Well, I'm going to say that we should wrap up. We want to wrap up. Let me just ask you guys each to share maybe final thoughts, take a second.

Jim Womack:

Well, here's a final thought for the lean crowd. This has been a particularly challenging environment. Two things at once, a fundamental disruption of the whole industry that Toyota is in. As Akio Toyoda has said, this is the once in a century disruption. I doubt that he has any data on that, but okay. On the product side there is this once in a century disruption, while there is this, if you will, biological disruption of the whole production apparatus. So that COVID comes in just in the middle of this electric vehicle and autonomous vehicle, and we haven't even talked about that, situation. This is just particularly challenging for a methodical, precise, tight organization like Toyota. Again, in the short term, they look a little bit plodding and unresponsive. My belief will be that in the long-term they will look a lot better than people tend to think they are in the short-term. As folks may know, Toyota did brilliantly with the logistics part of COVID for the first really 18 months of the crisis.

Jim Womack:

Then just too many suppliers went down and this is particularly in Penang in Malaysia that had been doing great with COVID. It really just wasn't there and then suddenly they locked down the whole city and closed all of the chip makers. Therefore even Toyota now at the end of the pandemic is suffering. People hear that and think, "Well, gee, this trouble is due to JIT," which

of course it's not because hardly anybody practices JIT outside of the Toyota world. So therefore how could that be the problem when hardly anybody's doing this? If you actually know something about this, no, that's not the problem. But it is that in situations both competitive and, what do we say, biological that are sufficiently disrupted even the best possible system does struggle. That we would love to believe all of us as human beings that we can build bulwarks against chaos and catastrophe. We just want to believe that.

Jim Womack:

Then you think, well, gee, Toyota's got this wonderfully robust, precise, thoughtful system. Surely they can deal with this. Yeah, some better than the average of the other players, but if they have a big enough wave sinks all ships. I remember that a big enough, when the tide comes in it raises all boats. Well, a big enough tsunami sinks all the boats, and this has been pretty tsunami-like what's been going on both competitively and out in the physical world.

Tom:

Okay.

Josh Howell:

I guess my final thought would be this conversation makes me think that perhaps what's being disrupted, at least in so far as our community might be concerned, are certain dogmatic notions. It's not, whatever, A3 or kata, it's not Toyota or Tesla, and lean or agile. It's, look, all these things can be helpful, can be effective, and the question is, what can we draw from all of it in our own practice as individuals, in our own processes as organizations to be both disruptive and methodical, to be both quick and thoughtful, pursuing high quality. I think TPS embodies that and has for the longest time, but certainly out in those of us emulating seeking to learn from Toyota and put it into our own practice often do and have fallen into certain dogmatic ruts. I don't know, I guess this makes me think that that's where the disruption might be I think to our benefit. Ours as a lean community should we choose to, whatever, open our minds a bit to learn from both.

Tom:

Well said. Okay, I am going to wrap it up. Thank you both Jim Womack, Josh Howell. Thanks.