

Under the Hood of Toyota's Recall: 'A Tremendous Expansion of Complexity'



In the wake of complaints about sudden acceleration problems that have led to the recall of millions of Toyotas over the past few months, the automaker has faced criticism over everything from the design of its cars to the failure of company executives to acknowledge and address the issue head on. Perhaps most damaging is the hit to Toyota's overall reputation for quality. Wharton management professor [John Paul MacDuffie](#) recently sat down with Takahiro Fujimoto — an economics professor from the University of Tokyo and a leading authority on the Toyota production system and automotive product development — for his views on what caused the crisis, how Toyota has handled it, and how other car companies should react to Toyota's predicament.

An edited transcript of the conversation follows.

John Paul MacDuffie: I'm John Paul MacDuffie from Wharton's Management Department. We are here today with Professor Takahiro Fujimoto from the University of Tokyo, perhaps the world's leading authority on the Toyota production system and automotive product development. He's also a colleague of mine with the International Motor Vehicle Program, an international consortium of researchers who provide insightful research into the industry. Taka, welcome to Wharton.

Takahiro Fujimoto: Thank you very much.

MacDuffie: You have studied Toyota and its production system for a long time. Can you tell us what surprised you about the recall crisis, and if there was anything that *didn't* surprise you?

Fujimoto: I was surprised to see that Toyota was the first to be caught in this trap of what we may call complexity problems. Society and the market are making stricter and stricter demands on all the cars and vehicles in the world. So this could happen to anybody. But I was a bit surprised that this happened to Toyota first, because Toyota executives had [issued] a warning about [being] in a very difficult situation regarding complexity. So they knew that this could happen to anybody.

MacDuffie: Toyota had always been one of the best at managing complexity, right?

Fujimoto: Right. So they were probably a bit overconfident that they could handle these kinds of complexities better than other companies. Ironically, as a result they probably took in way too much complexity. It was [beyond] their capacity.

MacDuffie: I know that one of Toyota's primary explanations for these problems is how rapidly they have grown in the last decade. As you think about everything you have learned, does that seem to you like a good root cause of the problem? Or are there other factors as well?

Fujimoto: It's really true that Toyota was growing very rapidly. But other companies, like Hyundai, were growing even faster than Toyota. So the growth itself was not the only cause. Growth multiplied by other factors was probably the real cause of the problems — other factors like the number of production lines, production facilities, number of models sold in the global market, and the growing complexity of each individual vehicle due to social pressure and market demand. All these things multiplied together created explosive expansion of the workload for handling quality problems. Although Toyota usually had the capability to handle these kinds of things, even they couldn't really handle this tremendous expansion of complexity.

MacDuffie: I know there's a saying at Toyota that a problem is a treasure. You want to find problems because each problem provides an opportunity for improvement. Under that philosophy, hiding a problem would be the worst thing. When you look at how Toyota has handled this crisis, do you see them living up to that philosophy of revealing problems and focusing on them to resolve them?

Fujimoto: Yes, to my knowledge they are not trying to hide the problems. But when a very complex problem happened, they were not sure to what extent this was a responsibility for the company, and to what extent other parties were responsible. So their attitude was, "Wait a minute. This is complicated." They were sure that they were not the only party responsible for this problem.

But it is also obvious that Toyota was at least partly responsible for many problems that were popping up one after another. Probably what they should have done was to deal with it as quickly as possible – [such as send] a senior person to America as quickly as possible and then have [the company] apologize for whatever [it felt was their] responsibility. So a partial but thorough apology, and definitely a quick apology, was what they had to do. But they probably hesitated to come to the U.S. because they were not sure to what extent they were responsible for those problems. Then people saw that as, "Gee, Toyota is escaping from responsibility for this problem." This is not what Toyota meant — but the way they handled the initial problem was very bad, I think.

MacDuffie: Yes, for a problem that appears in the factory, even if it's complicated, you have more control [over it] and more access to full information. But when a customer says something to a dealer, it is more ambiguous. It seems that Toyota had trouble taking that kind of information and recognizing a problem that definitely needed its focus and attention.

Fujimoto: Right. I think this can happen to any company which is confident of its quality. This has happened to other companies in the past, too. When you're very confident of your quality, this is a source of arrogance.

Back in the 1990s, I saw some of my friends complaining about how Toyota treated people when there was a problem. You know, they go to the dealers and then the dealer reports to Toyota about these problems. But [the customers] tended to get a reaction from the company that said, "The product must be good. We are confident of the quality of the products. So logically it must be your driving problems." That made many people very angry. I noticed these kinds of things were happening at first sporadically, but then more frequently. I was always warning that arrogance is the number one enemy of the Toyota philosophy. But they didn't take this seriously until big problems happened. And it was really sad to see that.

MacDuffie: Clearly what's happened has damaged the Toyota brand and reputation. Do you have some advice or recommendations for Toyota president Akio Toyoda on what would be the best way to help restore that reputation?

Fujimoto: Ironically this is really a long-term race, like an obstacle race, of handling growing complexities that we cannot avoid. Toyota was one of the frontrunners in making very complex products, like hybrids or luxury cars, at very high volume and then growing the volume. They were taking on all kinds of complexities, and they were the frontrunners in handling that complexity. Then they took on too much complexity and they stumbled. But this is a race that you are not allowed to retire from because there are customers waiting for you. So Toyota will have to stand up and go again. There is no excuse for them, and there is no room for them to retire.

They will have to just keep on building capabilities. That is the only solution in the long run. In the short run, they have to persuade people that, even though they made a big mistake this time, they will go back to find the root cause and do the Toyota Way of finding and solving problems. Later, they need to come back to make sure that everybody is convinced that this will not happen again.

MacDuffie: Sounds like "back to basics."

Fujimoto: Back to the basics.

MacDuffie: So not a change away from the Toyota Way or the Toyota Production

System?

Fujimoto: Right.

MacDuffie: But “back to basics” to build capabilities to handle the new demands.

Fujimoto: Right. I think the Toyota Production System or the Toyota Way as a philosophy is still a good way to handle customers’ needs quickly and accurately. But the headquarters in particular made a deviation from the Toyota Way. I’m not talking about production people, because I’m constantly visiting the production sites, almost every week. There are no signs of decreasing capabilities on their side. We have to understand that, so far, all of the problems picked up in the Toyota recalls are design quality problems rather than manufacturing quality problems.

MacDuffie: Yes, I think that’s an important distinction.

Fujimoto: Of course it’s true that production sites have problems. I go there and I see many, many problems there. But those production problems ... and quality problems that we see now in the news are not directly connected. In this kind of situation, people tend to pick up all kinds of bad news about Toyota, and of course this is a big company, so you can easily find 10, 20 items of bad news.

The danger is that people tend to connect the two problems. “This happened and that happened, so there must be causal relations between the two.” But this is not the case. There appears to be no connections between the design problems and the Toyota production system or Toyota Way.

I would probably say middle managers, particularly at headquarters, started to deviate from the Toyota Way by being arrogant, being overconfident, and also they started not to listen to the problems that customers raised. Toyota is a problem-finding, problem-solving company. This culture is still there in the factories and in product development centers. But in some parts of the headquarters, someone started to say, “Hey, this is our problem. I am responsible for finding my problems and solving my problems. It’s not [for] you [outside Toyota] to find our problems.”

Sometimes I’m critical of Toyota. But they get angry. They always say, “We want to find problems. So please, give us any clues on the problems you see.” But if I actually say, “This is a problem for you,” they say, “This is none of your business. We have to find the problem. Not you.” This attitude was growing for some time, I think, in some parts of headquarters. That was very dangerous. It is a good time to correct this kind of attitude and go back to the basics of the Toyota system.

MacDuffie: You mentioned complexity earlier and you talked about the demands of society and also the demands of the market. I know we have talked before about how a

car is an expensive, heavy and fast-moving object in the public space, and that is why all these demands face an automaker. Could you say more about that, elaborating on the complexity issue?

Fujimoto: Right. I don't say that a car is a special thing. A car is very different from a PC, for example, or an Internet product and other digital products in a sense that it's heavy and it's dangerous; it's fast moving as you said. This is why society is very strict in dealing with these products, because these products were born with original sin.... Because of cars, people are killed and then air pollution happens and it's noisy and oil is consumed heavily. So there are many bad things about the car. But there are many good things about the car. That's why we see 700 million cars on earth. So we have to solve all kinds of problems. And [the auto companies] can't stop innovating. They don't have the luxury of stopping innovations. Because of social pressure and constraints — such as regulations and customer requirements getting higher and higher — the complexity is getting higher and higher. What was okay 10 years ago is not okay now. For example, some of the things that are part of the Toyota problem now were not a big problem 20 years ago. So customers and society are fussier and fussier about what they expect from cars.

MacDuffie: And that creates tremendous demands on the designers, right?

Fujimoto: Right, it's a nightmare for the designers. You have to take on all these constraints. It's like solving gigantic simultaneous equations involving structures and functions. For example, with the Prius recall, the problem resulted because Toyota tried to improve fuel efficiency and safety and quietness at the same time through a nice combination of very powerful regenerating brakes, plus the latest antilock brake system, plus the hydraulic braking system.

But the relationship between the three kinds of brakes changed with the new design, and then drivers could have an uneasy experience when there was switching between the different brakes a little bit.... Toyota failed to see this problem in the right way, at least in the beginning.

MacDuffie: If all these things are happening to Toyota, would you say we can expect other auto companies to have problems with these issues as well? These challenges must face all auto makers.

Fujimoto: There are some specific Toyota things like arrogance.... But this complexity issue — nobody can escape from that. Everybody is in the same race. Toyota was ironically one of the frontrunners when they stumbled. A big failure happened there. But we are all in the same race. So smart companies, rather than laughing at Toyota, say, "Oh, this could be our problem, too." Some CEOs started to say, "Check all kinds of potential quality problems because this could happen to our company." And that's a

very healthy reaction.

MacDuffie: I guess that if Toyota is very good at recovering from this — that would be the optimistic view — then perhaps they gain some advantage in dealing with these issues ahead of other companies, if the other companies don't proceed.

Fujimoto: Right.

MacDuffie: Could you say which of Toyota's competitors you think might benefit from this recall situation?

Fujimoto: The companies which are truly quality driven. In this kind of situation, a frontrunner stumbles so people tend to say, "Hey, this is a great chance to gain market share in an easy way." That's very dangerous, I think. That company may become the next victim. So rather than this, they have to say, "Hey, this is the time when quality is very important, and in particular, safety is number one. And complexity is going up. So we have to be very careful not to dissatisfy customers." If they focus on their quality and safety, and make customers happy, then the company will grow and gain market share. The companies sticking to this kind of philosophy will, I think, be winners.

MacDuffie: I know it would be a sweeping assessment at this point, but do you see the U.S. automakers being in a position to do that well? This is a kind of opportunity for them.

Fujimoto: Right. If they see this as just a short-term marketing opportunity, that's very dangerous. But if they see this as a great opportunity to look at their own quality — improve the design quality and manufacturing quality at the same time — and make more customers happy, there is a great chance for them.

MacDuffie: Thank you very much for being here.

Fujimoto: Thank you very much.