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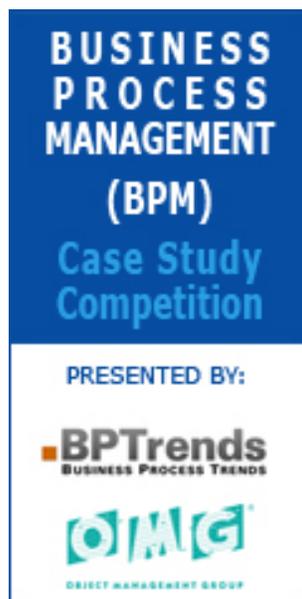
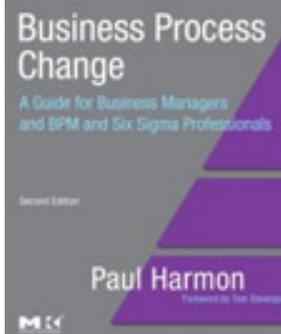


How Did Toyota Do It?

I was in a taxi on my way to the airport to fly to a BPM conference when I heard a radio talk show host announce that Toyota had just become the largest car manufacturer in the world. He then asked, "How Did Toyota Do It? I immediately thought, "That is a good question, and it is certainly a question that process people should be able to answer."

For many process practitioners, the answer might seem obvious: The Toyota Production System! Toyota is often thought of as the ultimate example of a company totally committed to a process focus and constant process improvement. In the early Eighties, when the Japanese car companies first began to make major inroads in the US market, a group of MIT scholars undertook a five year study of the various approaches to producing cars and eventually published a study - *The Future of the Automobile* - which concluded that while US and European companies were still using the production methods pioneered by Henry Ford in 1911, the Japanese car companies were doing something quite different. Later, three of the scholars who worked on that original study, James P. Womack, Daniel T. Jones and Daniel Roos, wrote a popular book describing what the Japanese companies were doing - focusing especially on the innovations that were taking place at Toyota. That book, *The Machine That Changed the World: The Story of Lean Production*, was published in 1990 and became an instant best seller. Toyota never used the word "Lean" but the American authors needed a word to describe their overall approach. They selected the word "Lean" and it stuck. Jim Womack went on to write other books and to found the Lean Enterprise Institute (www.lean.org) to promote Lean concepts.

Since then, as Toyota has become the focus of many different process writers, the work of the Japanese process gurus responsible for Toyota's innovations have become widely available. The most important is Taiichi Ohno's *Toyota Production System: Beyond*





Large-Scale Production, originally published in Japanese in 1978 and in English in 1988. Books by Shigeo Shingo, including *A Revolution in Manufacturing: The SMED System*, published in Japanese in 1983 and in English in 1985, are also important.

Additionally, in the last few years, several books have been written to provide readers with a detailed understanding of the Toyota Production System (e.g. *The Toyota Way* by Jeffrey Liker). A particularly interesting book is the recent *Toyota Culture: The Heart and Soul of the Toyota Way*, by Jeffrey K. Liker and Michael Hoseus, that focuses on how Toyota introduced the culture to US workers employed at Toyota plants in the US.

I started by reading several of the popular Toyota books, moved on to Ohno and Shingo, and am now reading articles and case studies published by Harvard and other universities. The picture is getting more complex as I continue to read.

Let's begin with the original question - How did Toyota become the largest, most efficient and most profitable car company in the world? Put slightly differently, how did Toyota manage, after World War II when Japanese production capabilities were largely destroyed, to mount a challenge to the US car companies that dominated the auto industry. In his book on the Toyota Production System, Taiichi Ohno talks about how, when he was first asked to help turn Toyota into a major competitor in the post World War II period, he was told it took 9 Japanese workers to do what a single US worker could do in the same period of time. Ohno recalls thinking that that kind of lead would be very hard to overcome.

The essence of the Toyota Production System, as described by all of the books, is a manufacturing system designed to deal very efficiently with small production runs. Initially, the Japanese simply weren't producing as many cars as US companies and they needed techniques that would allow them to produce smaller runs of cars very efficiently. They did, however, have one "advantage". Their plants were destroyed in World War II so they were forced to begin all over with a clean slate. Just-In-Time (JIT) manufacturing was developed first. In essence, parts arrived at the assembly plant just when they were needed. This avoided the problems associated with maintaining large stocks of inventory.

Teams of employees who focused on very efficient operations were a second focus. All of the books stress the importance of the teams of employees who assume responsibility for constantly improving their operations. In the spirit of Frederic Winslow Taylor, generally agreed to be the "father of scientific management", each step is examined and the best procedure is determined. For example, the order of tightening the bolts and the torque are all established, as is the time allotted for the procedure. The teams are constantly evaluating performance and if a worker takes more or less time to complete the procedure, the work and the procedure are examined carefully. If the worker takes less time, the team looks to see if he or she did it right. If it took the worker more time, they examine the work and the worker to see what is wrong. Once this evaluation is complete, the team re-establishes the procedure and the time allotted and the execution of each activity becomes an experiment that is continually used to identify problems or improvements.

So, part of the answer to the question is that the Japanese worked very hard to analyze the steps in an auto assembly process to assure that they did each step as efficiently as possible. Those who associate the Toyota Production System with Lean would point out that they apply a number of heuristics to assure that there are no wasted steps or activities.

Beyond that, there is the culture. The employees care about the company and Toyota respects its employees and supports lifetime employment. I remember talking with Geary Rummler when he returned from his first visit to Japan. He'd been part of a team that had studied Japanese processes. I asked him if he had discovered anything really new. "No," he remarked, "they are doing everything we advise companies to do. They are doing it very well, but there aren't any major process innovations. The biggest difference is that they care for their employees. US managers still think people are a resource to be used or discarded, as needed. The Japanese really understand the fundamental importance of people in any successful organization."

Stepping back from the picture presented in the Toyota Production System literature, the picture becomes quite a bit more complex. For one thing, a glance at a picture of a modern Toyota plant reveals

that they are largely automated. There are a lot more robots on the floor than people. One wonders exactly how the employee teams determined that their jobs should be automated. Similarly, a dip into the Toyota IT literature reveals that Toyota's IT department has had many of the same problems that other corporate IT departments have. Business managers don't communicate with IT analysts and vice versa. One study of a Toyota IT installation effort reported that the IT folks had to analyze the process from scratch to figure out what was going on. The employee groups may have made things efficient over the years, but the information was in the heads of the employees or in local documentation and unavailable to IT. To get a good view of how it all fit together, IT sent in its own analysts to do flow diagrams. I even talked with some people in Toyota sales and distribution groups who told me they had little or no process in their offices. As far as they could tell, the Toyota Production System was confined to the auto manufacturing plants. This suggests that the more enthusiastic Toyota books present a simplistic picture of Toyota.

I plan to develop a more detailed study of Toyota in the course of 2009. The more I learn, the more I realize that the answer to the original question isn't nearly as simple as one might expect. Process work has played a very important role at Toyota, but its not necessarily "process work" as many of us use the term, and its not nearly as neat as it is often portrayed in the books on Lean production.

At this point, as a tentative hypothesis, I have decided to attribute the Toyota "miracle," equally, to three sets of causes, as illustrated in Figure 1. First, there is the Toyota Production System, with its **emphasis on efficient processes**, on JIT, on people, on constant improvement, and on a fanatical avoidance of any type of waste. If this constitutes a third of the answer, then it suggests that Toyota puts a lot more emphasis on process than most companies do.

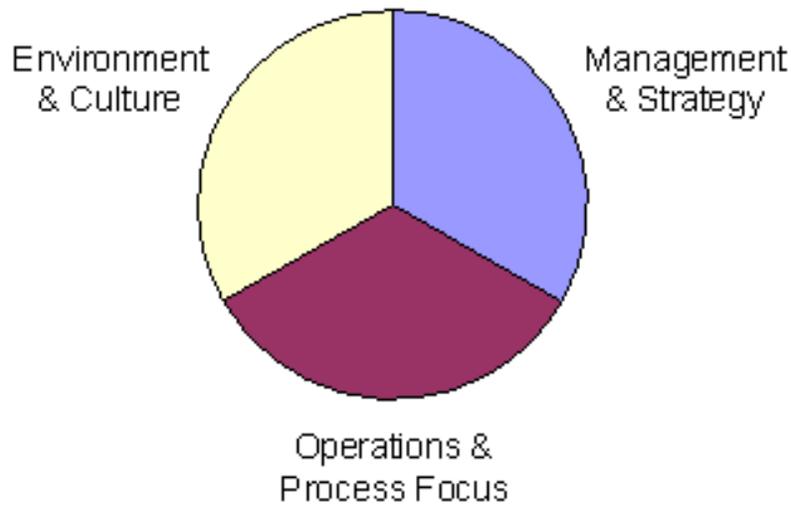


Figure 1. Possible Reasons Why Toyota Has Become Number One.

The second part of the answer derives, I assume, from the Japanese **cultural environment**, external to Toyota. Post World War II Japanese companies had to rebuild from the ground up. They began with very little and knew they would have to work hard to prosper again. The emphasis on lifetime employment, for example, wasn't confined to Toyota, but practiced by all of the leading Japanese companies. Japanese law allows the cross-ownership of corporations, and thus diverse companies shared board members and investors. Several books have stressed how this reduces the power of the Japanese stockholder and inclines management teams to focus on longer term strategies. And then, there is the fact that Japan has few natural resources and that gas has been particularly dear for several decades. High gas prices focused Japanese manufacturers on fuel efficient cars, early on, just as inexpensive gas and US laws focused US auto companies on large gas guzzlers.

A third reason is the Toyota **management team and its strategy**. A group of executives made decisions about what types of businesses to enter and when. These executives chose strategies and made decisions about when and how to design and manufacture what types of cars. They also chose to adopt robotics early on and have installed robotics extensively. Similarly, they decided when they would begin to establish plants in the US, Europe, and SE Asia and made the commitment to keep Japanese management teams in those locations until the natives got it right. Toyota has been very well managed from the beginning.

I'm about as pro-process as anyone could be. I'd love to be able to state that "Toyota did it" by a fanatical focus on process. In fact, I suspect that process is a major part of the answer, and wouldn't have expected it to be otherwise. The more I read, however, the more complex the picture seems. I have already begun to organize my study around a historical timeline to determine how well Toyota did, year by year, as different environmental, strategic and process innovations were introduced. The whole issue fascinates me because it challenges those of us who promote a process focus to decide just how to balance the focus on process with other concerns that any CEO faces on a daily basis. For many business school professors, a process focus is just an element of operations. For some of us, it involves quite a bit more, but there are still limits on the role that processes play and it's important that we determine and define those limits.

So, this is an early and tentative report on my meditation on Toyota and the role of process in creating world-class organizations. As I learn more, I'll write again on this topic. Meanwhile, I'd welcome any insights from others, especially those who have had experience with Toyota or with automobile production.

Till next time,

Paul Harmon

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