Comparing the Five Lean Principles to the Toyota 14 Principles

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In 2006, I read the book “The Hitchhiker’s Guide to Lean” by Andy Carlino and Jamie Flinchbaugh. The book was very easy to read and insightful. In the book, Andy and Jamie talk about the five Lean Principles which they teach. I had already read “The Toyota Way” by Jeffrey Liker. I liked how Andy and Jamie only had 5 principles. It made it easier to remember, but everywhere I go people refer to the 14 Toyota Principles in “The Toyota Way”. In light of Toyota’s recent problems people are reluctant to mention Toyota as a high standard, because they don’t want the other person start to tune them out.

In order to help others see the value of five simple principles but not lose the tie to the 14 Toyota principles, I will look at each of the 14 Toyota principles and examine how they relate to the five principles from “The Hitchhiker’s Guide to Lean.”

The first question to answer is: What are the five principles from “The Hitchhiker’s Guide to Lean”? Here they are:

The Five Lean Principles from The Hitchhiker’s Guide to Lean
1. Directly Observe Work as Activities, Connections, and Flows
2. Establish High Agreement of both What and How
3. Systematic Waste Elimination
4. Systematic Problem Solving
5. Create a Learning Organization

As you read the comparison, I hope to give a better feel for the behaviors and essence of the five principles from Andy and Jamie.

Toyota Principle #1: Base Your Management Decisions on a Long-Term Philosophy, Even at the Expense of Short-Term Financial Goals.

At first glance of the 14 principles, the first one seems to be the hardest to tie to the lean principles, but with deeper thought the connection can be made. If an organization creates a clear vision of their ideal state, it dedicates the organization to being a great learning organization (Lean Principle #5). Otherwise, the organization will not make strides towards the ideal state and will never reach its full potential. An organization may have a goal to improve their processes whether it is the near future or several years down the line, in order to make gains towards the ideal state. Take the example of designing a new product platform, the future may be three to five years down the road. If the organization learns from the successes and failures of
the current product platform design, as well as conduct trials on designs with the future in mind, the company dedicates itself to the long-term future. A short-term company doesn’t emphasize learning. Their interests lie in trying to make the current platform a success and they do not document and spread learning for future platforms.

Also, if an organization truly observes its business, market place, and customers (Lean Principle #1) it can more deeply understand what the customers expect. By continuing to strive to satisfy the customers’ needs, the organization adheres to long-term thinking. An example would be Zappos. If a customer calls, Zappos and they don’t have the shoe they customer wants in stock, they will refer the customer to a different company that has the shoe and size wanted. Zappos is more concerned about the long-term relationship of having the customer come back because of the excellent customer service. They are not just focused on that one time sale.

**Toyota Principle #2: Create Continuous Process Flow to Bring Problems to the Surface**

The Toyota Principle says “Bring Problems to the Surface”. The underlying message is that continuous flow is a great concept/method/tool to help make problems visible so an organization can systematically solve them (Lean Principle #4). With continuous flow, the process is like a well-oiled machine. When something goes wrong, it becomes apparent quickly and the best way to keep the process running smoothly is to solve the problem down to the root cause so it won’t affect the process again.

Making problems quickly visible through continuous flow helps enable observation of the current reality (Lean Principle #1). The continuous flow stops and attention is brought to the issue so managers, team leaders, and operators can directly observe the work and gain a better understanding of the process and enable better problem solving. In order to achieve continuous flow, waste must be driven out of the process systematically (Lean Principle #3). If not, the process will build up waste between value-added activities and continuous flow will not be achievable.

**Toyota Principle #3: Use “Pull” Systems to Avoid Overproduction**

Overproduction is the worst of the seven wastes, because it creates much more waste in the system. The product must be stored (inventory waste), handled multiple times (transportation waste), thus allowing for potential defects from handling and storage (defect waste), and so on. By using pull systems as a concept/tool, the processes become connected, which gives the customers an effective tool to communicate with the suppliers. This communication alleviates overproduction of materials, which eliminates waste from the system (Lean Principle #3).

**Toyota Principle #4: Level Out the Workload (Heijunka)**

Most people work at an uneven pace. Some days, employees are overloaded and working all hours and then a few days later the same employee has barely enough work to fill a day. This can happen within the same day or even hour. The unevenness in work, whether it is on the line or in the office, creates more work between processes. Leveling out the workload consists of balancing the work amount amongst employees on the shop floor and in the office. The object is to have everyone working at an even pace everyday. Leveling the work will help the company easily spot waste that is causing the unevenness and eliminate it from the process (Lean Principle #3). Leveling the workload not only helps eliminate the seven types of waste (transportation, inventory, motion, waiting, overprocessing, overproduction, and defects), but also the overburden of people and resources. Identifying and eliminating waste is key to continuous improvement.
**Toyota Principle #5: Build a Culture of Stopping to Fix Problems, to Get Quality Right the First Time**

Stopping to fix problems puts an organization in a systematic problem solving method (Lean Principle #4) so that bad quality is not passed on and variation is reduced from the system. Reducing variation in the system creates a more stable process that helps prevent passing on bad quality to the customer. This creates more waste in the system, because rework or reprocessing is then needed to correct the issue or the product may be scrapped.

In order to build a culture of stopping to fix problems, there must be high agreement on what the system will do and how it will work (Lean Principle #2). If there isn’t high agreement on the what (stop the process to fix problems) and the how (the system/standard work in place to do that) then the culture will not change. Once high agreement on the how is in place, a leader would come to the area and observe the issue in order to fix the problem (Lean Principle #1). The best example of this is the Toyota assembly lines. When an operator passes their 70% mark and they are not 70% complete with their work, they pull the andon cord. The team leader comes to the station immediately and asks what the issue is and how they can help. If the team leader can help resolve the issue they pull the andon signal again which turns it off. If they can’t fix it, when the vehicle hits the red line, the assembly line stops. This sends another signal and the group leader comes immediately to see what the issue is and how they can help.

**Toyota Principle #6: Standardized Tasks Are the Foundation for Continuous Improvement and Employee Empowerment**

The term “high agreement” means that everyone is in agreement (not just the “high” level of the company) on what is to be accomplished and how it will be accomplished (Lean Principle #2). In one word, this is “standardization.” The standardization allows for a baseline when a problem arises. If standards are being followed then the problem becomes easier to diagnose. Once the root cause is discovered, allowing the employees the freedom to improve the standard so the issue doesn’t surface again promotes empowerment and respect for people. This respect for their knowledge of the process will help to foster more improvement ideas from them.

Standardization allows for easier systematic problem solving (Lean Principle #4). When an issue surfaces, the first question should be, “Is the standard being followed?” If not, then ask, “Why?” If the standard is being followed then the question is, “What is wrong with the standard?” These are simple questions that anybody can ask. This doesn’t require any specialized training, which allows everyone in the company to participate in continuous improvement easily.

**Toyota Principle #7: Use Visual Control So No Problems Are Hidden**

In a lean system, the mentality is to make problems visible and covet the opportunities for improvement. Scorecards, 5S, standardized work, and andons are some of the tools used to create visual controls and bring problems to the surface. These visual controls make it easier for someone to identify if there is an abnormal condition while directly observing work (Lean Principle #1). The easier it is to see the abnormalities, the more beneficial direct observation of work becomes in eliminating waste (Lean Principle #3). Without visual controls, directly observing work is more difficult and creates waste by asking more questions in order to understand what the normal condition should be before determining if it is abnormal or not.

Once problems are discovered, then employees can solve them (Lean Principle #4). A root cause can be found and countermeasures can be put into place to prevent the abnormality from resurfacing. Countermeasures usually involve putting more visual controls into place or
improving the existing visual controls in order to make the specific problem visible before it becomes an issue again

**Toyota Principle #8: Use Only Reliable, Thoroughly Tested Technology That Serves Your People and Process**

The first part of the Toyota Principle is to use only reliable, thoroughly tested technology. In order to do this, an organization must be dedicated to extensive experimenting and learning (Lean Principle #5) about the technology before putting it into place. Proper experimentation of the technology is critical to applying the technology correctly for the most positive business impact. If it isn’t applied appropriately, more waste will be created in the system.

The second part of this Toyota Principle talks about using technology that serves your people and processes. The best way to have a clear understanding of what an organization’s people and processes’ needs are is to directly observe the work (Lean Principle #1). If the true needs of organization’s people and processes are not met, then the technology is creating waste. People and processes may be doing work that is not truly needed or even worse, the technology could be not used at all. The technology should be modified to fit the organization’s needs and not modify the organization’s needs to fit the technology.

The best way to know if a technology serves the people and process is to clearly define the problem that needs to be addressed by the technology. It is very critical that a systematic problem solving methodology is in place in order to help with this task (Lean Principle #4). A company would not want to invest in an automated storage/retrieval system to move parts, when the true issue is the waste of transporting the material across the plant. In this case, the technology is not serving the needs of the process

**Toyota Principle #9: Grow Leaders Who Thoroughly Understand the Work, Live the Philosophy, and Teach It to Others**

In order for an organization to develop leaders who understand, live and teach the lean philosophy to others, the company must allow the people to learn within the organization. This takes a dedication to being a learning organization (Lean Principle #5). This involves allowing the leaders to directly observe work so they can learn the processes themselves. Once a leader understands the work, it becomes easier for them to teach it to others. This allows the organization to learn more about itself and continually improve.

When leaders are cultivated from within the company, the transition from one leader to another becomes much easier. There is already an understanding and high agreement on the philosophy and direction of the company (Lean Principle #2). When an organization has established common thinking and common direction with all the leaders within the organization, the company becomes more stable and there is no ground lost in continuous improvement or a change in the company’s direction before, during or after the transition.

**Toyota Principle #10: Develop Exceptional People and Teams Who Follow Your Company’s Philosophy**

This is an extension of Toyota Principle #9. If the company doesn’t develop leaders who understand the work, live the philosophy and teach it to others, then exceptional people cannot be developed who will follow the company’s philosophy. This correlates to Lean Principles #5 and #2 from above.

**Toyota Principle #11: Respect Your Extended Network of Partners and Suppliers by Challenging Them and Helping Them Improve**
A company’s partners and suppliers are a key aspect of the business. The company should treat them as an extended part of their supply chain and respect them in the same manner all the internal employees are respected. This creates a fully connected value stream from supplier to customer acting as one entity beyond just the physical walls of the company. With everyone acting as one, high agreement on improvements and direction can be achieved to create a more efficient value stream (Lean Principle #2).

Once the improvements and the direction of the value stream are agreed upon, then the company can help the partners and suppliers to eliminate waste from their processes (Lean Principle #3). By eliminating this waste from the entire value stream, the company can reduce its total cost. This allows them to stay ahead of their competitors and also allows the partners and suppliers to become more profitable and stay in business, creating more respect and a better relationship.

*Toyota Principle #12: Go and See for Yourself to Thoroughly Understand the Situation (Genchi Genbutsu)*

“Directly observe work as activities, connections and flows” (Lean Principle #1) is stating the same philosophy as this Toyota Principle. If leaders don’t directly observe work it will be very hard for them to thoroughly understand the situation and be able to contribute to solving the problem or improving the process effectively.

*Toyota Principle #13: Make Decisions Slowly by Consensus, Thoroughly Considering All Options; Implement Decisions Rapidly*

Developing a consensus can be hard to do. An organization must gain high agreement on what options to implement and the how to implement the changes (Lean Principle #2). To gain high agreement, an organization must have a common understanding of the situation through directly observing the work (Lean Principle #1). This will enable people to have correct and updated information on all the options. There must also be a common understanding on how to systematically eliminate the waste (Lean Principle #3) and solve problems (Lean Principles #4). Without this common understanding it will be hard to get a consensus on how to close the gap between what is actually happening and what should be happening.

*Toyota Principle #14: Become a Learning Organization Through Relentless Reflection (Hansei) and Continuous Improvement (Kaizen)*

Reflection is a process that allows an organization to identify what the ideal outcome would have been and compare it to what the actual outcome was. This allows the organization to learn (Lean Principle #5) from its current process. Without relentless reflection on not only what went wrong but also what went right, it is extremely difficult to continually improve. By reflecting and applying the learnings, the organization improves the process for the next time. It also prevents the organization from making the same mistakes again, allowing more learning to occur the next time through the process.

Making reflection a normal part of the learning process establishes high agreement on what and how the organization can improve upon (Lean Principle #2). Reflection is worthless if it is not used with the purpose of learning improvement. The only way to truly improve is to reflect back to prior issues and integrate the learnings into the next processes.

Lessons from Toyota are very valuable, especially today. An organization can learn from the lessons of Toyota over the last 50 years, but the organization must develop and travel down its own lean path. The lean principles talked about in this article allow everyone in the organization to practice lean thinking on a daily basis. Toyota can also serve as a good example
of what can happen when an organization decides to get away from practicing the lean principles.

I hope many more companies can continue to learn and practice these lean principles.