Lean Transformation: Learning to Learn from Lean

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Close to twenty years after James Womack and Daniel Jones coined the term « lean » to describe Toyota's unique practices in the automotive industry, the lean enterprise has come be accepted as a superior model of how businesses plan, organize and run their activities rather than the manufacturing quirks of a singular Japanese automaker. In times both of plenty and of crisis, the lean model allows the companies who succeed in applying it to gain market share and grow their top line by satisfying their customers better, while also increasing their bottom line by constantly reducing waste and a very frugal approach to capital expenditure. Furthermore, lean enterprises also garner a distinct advantage from aggressive cash management thanks to their focus on improving on time delivery while reducing inventories – seen as the worst kind of « waste » in any operation. Finally, better cash management also enables lean companies to invest in developing new products designed to truly satisfy their customers.

Yet, lean « transformation » remains often elusive: many try but few succeed – and those who do succeed, tend to do so spectacularly. Over the past fifteen years I've had the privilege of studying closely many transformation attempts, and of witnessing repeatedly how Toyota's advice (the company has been remarkably open with its method, never abandoning hope of teaching it to its suppliers) has been translated by other firms, often changing it radically in the hope of making it more « applicable » to themselves. As I've argued elsewhere, the most striking difference in interpretation is that for most companies, lean transformation is seen as *applying the lean tools to every process* – in essence, fixing processes – whereas the Toyota veterans (« senseis » in the lean jargon) have argued all along that transformation is about using the lean tools to *develop a kaizen mindset in every employee.*

This difference is by no means nit picking. It highlights the fundamental, irreconcilable gap between the traditional management mindset and a lean approach. Indeed, as I'll try to demonstrate, this misunderstanding largely explains why so many transformation efforts are disappointing beyond the early low-hanging fruit (which could be gathered with any other improvement method) and in spite of management commitment, consulting fees, and a wide range of efforts by dedicated individuals within the organization. Mostly, we're looking for the key under the light post, but the truth is elsewhere. I'll try to address three basic issues: 1) what is lean transformation? 2) What is lean's own transformation mindset? And 3) what are the implications for a transformation program.

1. What Is Lean Transformation?

With hindsight, it turns out that lean transformation has been defined by Toyota at the outset in its earliest published article on its fabled *Toyota Production System* in 1977. In this paper, the authors (one of them who was to become Toyota's president and architect of its global expansion) describe TPS as having two key elements:

1. « Just-in-time » production: manufacturing only the necessary products at the necessary time in the necessary quantity with the minimal amount of stock to hold the process together, as well as continuously reducing costs by eliminating waste.
2. « Respect-for-human » management where all employees are allowed to display their full abilities through participating actively in designing and running their own working environment.

This means endeavoring to achieve three core things. Firstly a small number of very challenging business objectives, secondly, sustained by creating and maintaining just-in-time conditions in operational processes and thirdly to transform management practice in order to create the management attitudes that will sustain jus-in-time through continuous improvement by continuously developing employee's abilities.

Lean transformation is typically about making the business radically better on a small number of KPIs. Lean is typically geared up to dramatically increase on-time-delivery (99,5 % OTD is considered by Toyota to be 5000 missed deliveries per million, so: poor rather than good) while reducing inventory, and halving quality defects (ppms) year after year while improving productivity (pph – parts per person per hour, or sales/ headcount). Beyond these basic objectives, other challenging goals can be considered, such as regular product introduction with zero engineering change after launch and so on. The important thing to realize is that the lean approach frames the transformation problem in terms of very challenging *improvement* objectives (in the order of 20% to 50% per every two years) on few, basic business-wide indicator.

The second aspect of lean transformation is sparing no effort to, as quickly as possible, get operational process in « just-in-time » conditions and keeping them there. The essence of just-in-time conditions is that the short-term schedule *will* be maintained. Planning improves daily to better understand customer demand, but the essence of the effort is in

understanding that fixing the level of resource and accepting lateness is simply out. Each process has to deliver on time to the downstream customer. This revolutionizes process management because rather than have a soviet style central programming function (now largely computerized) that tells every process segment what to make by when, planning is concentrated at an upstream point in the process, a « control tower » which pulls on the segment closest to delivery, and a mechanical system (such as kanban cards in production) then tells all the preceding processes what to do by when. This has a number of wide ranging impacts on how operations are run:

➤ Frontline management no longer has any choices to make in terms of what to produce, or not to produce. Its mission is crystal clear: deliver the downstream request without delay – period. Management's role then becomes to solve the gaps in the process before they impact delivery, not after. In essence, dealing with « exceptional » events (snow in the winter, staff off on holidays in the summer, etc.) becomes *part of the job.*

➤ Maintaining a process is just-in-time conditions is rather demanding since all that can go wrong usually does. Whereas traditional management tends to have a reaction time in weeks (not to say months), reaction time in just-in-time conditions is a matter of minutes to hours. In essence, the management structure, from stable operator teams coordinated by a team leader to supervisors to support staff is set up, to be able to respond to « out of just-in-time » in a matter of minutes.

➤ Quality is key aspect of the just-in-time focus: only good parts (or services) can be passed on to the next step. As a result, quality must be tested in sequence after each operation, rather than inspected at the end of the process. Every quality concern has to be reacted to in a matter of minutes inasmuch as this will be the greatest threat to properly delivering to the downstream step.

➤ Getting people focused on such precision and reactivity day in day out is no simple task, and will only succeed if they own the challenge of just-in-time delivery. Toyota's response is to continuously shave resources off existing process and to support their employees in solving problems and having ideas to keep up the delivery. In this manner, employees are constantly involved in improving and redesigning their working environment to create leaner and leaner processes.

➤ The only way to continue to improve delivery whilst reducing resources is to solve fundamental problems one by one by going beyond symptoms to discover root causes and solve those.

Maintaining any process in « just-in-time conditions » requires the kind of management structure that can perform two key tasks:

1. Immediate problem solving to get the process back in just-in-time conditions as soon as things go wrong. If delivery is a few minutes late, what do we do to catch up? If parts are being reworked, which delays delivery, what do we do to make sure that no bad parts are passed on and the missing parts are recovered for delivery on time? If a service has not been achieved successfully on time, how do we get back on schedule?

2. Recurring problems must be solved one by one to fundamentally improve the process capability and not require as much resources for recovering problems day after day.

Not surprisingly, processes in just-in-time conditions are both more effective and more efficient by orders of magnitude, but also require a radically different form of management to be kept running.

Mainstream management is mainly about *deciding* and *executing*. Most managers come to work facing a day of situations where decisions have to be made, and then getting the organization to execute these decisions once they've been taken. Accordingly, employees complain that decisions are unclear, late in coming or plain wrong, and that they're not given the necessary clout or means to implement correctly (particularly since existing processes often get in the way and can't be changed without further decision.) By contrast, lean management is about *improving* and *teaching*. Management's key role is to select a few topics which need to be improved come rain or shine (on time delivery, quality, inventory, ergonomics, flexibility, productivity are typical lean topics) and a target is set for improvement through a Plan-Do-Check-Act cycle on these topics at every level, from the boardroom to the front desk. To obtain these improvements, managers don't decide as such, but coach their employees in solving problems in the right way (which, clearly, involves a great deal of influencing). Employees learn to solve increasingly complex problems by using the problem solving methodology time and time again, and as they do so, they redesign their own processes. A key benefit is that works then makes sense, as staff understand what is expected of them (situations are defined as problems they have solve), have a say on how they do their own work (they've got ownership of each problem they solve) but need to work with others (lean problem solving is about individual responsibility but team discussion and experimentation), and are not left to their own devices, as the whole problem solving process is closely monitored and steered by their own manager. In this environment,

an employee is never told exactly what to do, but is supported more or less narrowly (according to competence) on how to understand the situation and on what kind of solution to look for and try.

In practice, lean transformation is about 1) a set of challenging objectives on key, basic, business-wide indicators, 2) using the lean tools sustain the improvements necessary for maintaining just-in-time conditions and 3) train top and middle-management to a robust problem-solving method and how to use it as main management method. Indeed, Toyota managers have repeatedly claimed that PDCA was their core management method, and the puzzled response has usually been: how can a problem solving methodology be a management method? In the lean mindset, results are the outcome of processes which are maintained in just-in-time conditions by managing by problem solving to continuous improve performance and reduce costs.

2. What Is The Lean Transformation Mindset?

Getting from here to there sounds like a tall order (not only do I have to get rid of my MRP and pull manufacturing by kanban, but I also have to train every middle-manager to radically change their day-to-day management practice?), but why would we believe getting superior results on mature markets is *easy*! Many companies have already committed considerable resources to enact such a transformation. To their dismay and frustration, they learn to appreciate their organization's amazing scope for passive resistance to the lean approach. No matter how many consultants and kaizen events one can throw at a process, processes tend to stubbornly return to their original shape after a few weeks. The issue here is, to paraphrase, that the solution to problems are unlikely to be found in the mindsets that created them in the first time. Firms typically try to teach their employees to adopt lean attitudes through traditional teaching methods, as, as such, fail.

Lean is a fully integrated mindset that has its own approach to learning. Individual and collective learning being one of the underpinnings of lean management, the learning approach is well developed and largely explicit in the lean endeavor – contrarily to traditional management where learning is not nearly as important as compliance. Lean's learning philosophy and practice makes a four fundamental assumptions about how people learn, which instruct how change is tackled in lean organizations:

1. People learn from their boss
2. People learn by doing
3. People learn by confronting their opinions to other's perspectives
4. People learn by self-measuring

People learn from their boss – this should come as no surprise. Human beings are unduly influenced by who has power over them. We consciously or unconsciously model ourselves on who we admire, respect or fear. In most organizations, the immediate boss and, more to the point, the boss one removed is key influences on how employees see their jobs, themselves and what is appropriate or inappropriate behavior at work. It is safe to assume that the boss has a great influence on every staff member. Unfortunately, management thought has progressively divided labor between expertise and power. It is currently assumed that the boss' main skill is to organize resources, and that technical knowledge is just one of such resources. In other terms, a manager is seen as a competent administrator who divides work and outsources it around, without necessarily having to understand the mechanics of every job. The lean framework starkly exposes this fallacy where the boss is the teacher – period. Consequently, the manager must know how to do the job better than the subordinate. No one is expected to be adept at every detail, but managers certainly are expected to have enough experience and insight to understand the difference between a bad job and a good job on every task in their responsibility area, and to coach employees accordingly. In established lean companies, a manager will have a checklist of skills to be mastered by her employees at each level, with both technical skills and relationship or managerial ones, and will discuss regularly (every three to six months) with the employee which problems to tackle to hone their skills according to the checklist.

People learn by doing should be self-evident in an empirical world, but the truth is that scientific thinking (hypotheses testing, empirical based development of knowledge) has hitherto not penetrated very deeply into the business world. Business training largely remains philosophic: classroom teaching of broad-brush principles, leaving any experimenting to the students themselves. In lean thinking, as in science, testing *is* learning. Learning happens when you try something for yourself in your own area. In other words, when you can see the consequences of your action because you understand the local context well enough to grasp the impact of doing this or that. Formalized kaizen « events » are the most structured situation in this respect, mostly developed for non-Toyota westerners, but any kind of hypotheses testing is par for the course. For instance, employee suggestions in

the Toyota context are only validated when they've been implemented. More importantly, the employee is not left to his or her device during the testing phase: it is the superior's responsibility to ensure this delicate phase is conducted rigorously. A suggestion by an employee, by example, will first be discussed with the supervisor to clarify the problem, then a testing period will be found to try it out, then the supervisor will make sure the person convinces every other person in the team, as well as the other shifts, and only then will the suggestion be considered to be validated. Telling someone what to do simply doesn't make much sense in the lean framework. It has to be accompanied with a discussion and follow up on how to test, reflect and then generalize the topic under discussion.

People learn by confronting their opinions with other people's perspectives. This is another key to adult learning. Most conflicts in organizations are due to people arguing about solutions without having reached an agreement on the problem. Most business problems are transverse: various people in the process contribute to the problem to various degrees. Understanding the problem usually involves understanding every other participant's take on the issue as well. For instance, just-in-time planning is made much harder by customer demand variation. However, understanding the cause of customers' demand variation can only be achieved by discussing often and in detail with customers themselves – which one of their constraints are they securing which creates variations as a result. The trouble with learning by doing is that, left to itself, the learning can be very slow. The main difficulty in learning from an experiment is drawing the right conclusion from the test phase. By encouraging teamwork as in solving problems across functions and across the hierarchy, experiments are discussed from many different angles, and true understanding emerges. In knowledge management terms, rather than share the information people already have in common, by solving problems together, people learn to share the information each individual has (from their expertise and experience) and that the other's don't. In lean terms, confronting one's opinions with others is also key to eventual implementation. Clearly not every person's concerned can be addressed, and the final solution will no doubt please some and not others. Still it is important that every persons' concerns have been recognized, acknowledged and seriously taken in consideration. By this process, other people will understand what you're trying to do, and be in a position to do what they can to help you succeed (even if they don't necessarily see their immediate self interest) rather than default to « not invented here. »

People learn by self-measuring is a core insight to individual and collective progress. It is often assumed in traditional management that people can't change, or, at the very least, that resistance to change is endemic. Experience, however, shows that some people do change. Athletes, for instance, keep breaking records year after year by finding different ways of performing the same codified actions. Much of lean learning theory harks back to Kurt Lewin's original understanding of individual progress through team support, as is reflected in the core technique of one of the most challenging personal changes ever: breaking alcoholic dependence. Stripped of all technique, an alcoholic anonymous meeting is about getting together regularly with the same support group, and announcing to the group the number of consecutive days without a drink and then sharing the difficulties involved. As with jotting down own's weigh on the bathroom wall or clocking every lap when going running, self-measurement (and comparing it within a reference group) is a key ingredient to individual improvement. And, indeed, lean systems are all about visualizing self-measurement. Whether on the shop floor where missing boxes are made obvious by the gaps in the supermarket ant the accumulation of kanban cards, or where hourly production is compared to hourly targets with an explanation for the gap, or whether in middle management open spaces where individual action plans are tacked on the wall with a visible marks to denote what is on track and what is late or failed, self-measurement is endemic in lean systems. Self-measurement means making that paper cross on the tracking sheet oneself – not measurement by outside auditors, or by one's superiors, or, save us, by the computer system. No external source of feedback has the same engagement potential as one's own performance tracking.

Lean learning's framework is both specific and explicit. Lean's learning theory is reflected in most practical applications seen on the system. In effect, Toyota's own formulation of its management « way » is : Challenge, Go and See for yourself, Kaizen, Respect and Teamwork. The emphasis is on the boss leading by constantly going to the shop floor to see the facts of the real situation with the real people, then on stressing learning by doing by setting problems to solve and teaching people how to do so with the PDCA methodology. But there is also great importance set on teamwork: getting all functions to cooperate to solve problems together, and on developing every one's abilities by supporting people in their quest for improving how they do their jobs – which is sustained by a « problems first » attitude. Problems are not seen as a source of shame, but as improvement opportunities. There is no blame attached to mistakes, if the learning from them is clear. The catch phrase « making people before making things » is the reflection of a deep understanding that

organizational learning necessarily stems from individual learning. As the boss coaches the employee in problem solving, the employee learns, but the boss also discovers new aspects to the detailed realities of the situation, which only she can put in a larger context to inform here strategic vision. Furthermore, more often than not, the employee will come up with an idea that will both surprise and challenge, and open new doors.

3. What Impact For Lean Transformation Programs?

A sizeable barrier to entry into lean is that it's hard to make something new from the old. In other terms, successful lean transformation programs need to be designed according to lean thinking is order to succeed at establishing lean practice, rather than conceived from a traditional standpoint. Unfortunately, change program organizers are rarely experienced in lean on the shop floor. More importantly, the senior executive who purchase these programs are also, by nature not well versed in lean (if not, they'd do it themselves). Consequently, many lean transformation programs tend to have a traditional change model at their core. These programs are staff-based, typically a « lean office » regrouping the company's « lean experts » and activity based with tool-based standardized workshops being rolled-out to all processes. This approach has the merit of being easy to start, as it is not too threatening to the organization, and also has the advantage of bringing in early « low-hanging fruit » benefits. Unfortunately, these anecdotic results rarely build up into significant budget-level results, and the improvements tend to be hard to sustain. Sooner or later, the program needs to adopt a lean thinking change model to succeed at the cultural transformation.

What would such a program involve? Firstly - and this is often a showstopper - senior executives sponsoring the program must accept that before lean techniques are rolled out to the organization, they must learn them themselves. Learning cannot be delegated, purchased or outsource. Lean transformation can only be conducted in one's own area, having made the effort of learning by doing oneself first. The main reason is that employees will, consciously or not, by and large align themselves with their boss' behavior (walk as opposed to talk). The other reason is that as people grapple with the practical implications of the lean change, many decisions – some of them unreasonably detailed – will go up the ladder to end up on senior management's desk. If the leader hasn't got the experience to understand the often critical issue underlying an apparently petty complaint, he or she can react the wrong way unwittingly and send a strong message down the ranks that, regardless of what is being

said, « lean » is just the current fashionable raindance and not more than lip service needs to be paid. More importantly, as the lean changes take effect, some strategic – or at least critical – issues will emerge in terms of product strategy, dealing with suppliers, IT systems and so on. If the leader hasn't gained the insight from firsthand experience with the lean perspective, he or she will not be able to make the right call on larger issues and end up self-defeating the lean expert's heartfelt efforts. People learn from their boss, people learn from doing, people learn from confronting their opinions to other perspectives, people learn from self-measurement. The principles of lean learning point to one inescapable conclusion, any lean transformation initiative is doomed if the most senior person is not involved knee deep, and does not consider himself or herself the « learner-in-chief. »

Secondly, a lean program has to be rolled out through the line, and not from staff functions. Learning by doing means that lean can only be learned in one's own area or responsibility. After the senior leadership, operational leaders must be taught lean practice, level after level. To do so, clear lean « exercises » can be detailed for operational managers and lean experts can be used to steer them through the early experimenting and to make sense of their initial conclusions. Indeed the « sensei », or « master » has a pivotal role in lean enterprises such as Toyota, as in the person who will push you to explore domains you're currently unfamiliar with. But the sensei in no way replaces one's own both as first source of teaching (in practice, senseis tend to have first been very senior and respected line leaders who later become full-time teachers.) On the outset, operational leaders have to taught how to 1) create just in time conditions for their processes and 2) develop managing as improving within their ranks. Not an easy challenge by any measure, but change comes from the top.

The third wide-ranging implication of the lean learning framework is creating platforms for teamwork, in the sense of solving problems across functions. One such immediate platform can be a weekly production planning meeting where the obstacles to just-in-time delivery to schedule can be cleared out: will the machines be available, and if not, how is maintenance going to solve the problem? Will all components (or information) be on hand, and, if not, what is procurement suggesting? Will all workers show up for work in the morning, and, if not, what is Human Resources' plan? Such a meeting is not just a quick debate between production and logistics, it's an opportunity for all key functions to learnt to solve problems together. The aim of the meeting is not to review the status of current plans, but to highlights the barriers to achieving schedules and to formulate the proper response. An other such platform for teamwork can be a regular meeting about new product development where all

key functions, such as marketing, costing, product design, process design and production can discuss the on-going project and highlight future difficulties and issues to keep to the project schedule. By solving two or three issues a week in each department, the project is bound to come together both more effectively and with better results for the customer.

A final implication for lean transformation programs is that they have to establish a clear link between budget-level indicators and shop floor experiments. Self-measurement can be ultimately established in a deployment chain from strategic intent to divisional policy to budget targets to operational indicators objectives to shop floor visual management. Such a mechanism is usually rare in non-lean companies, precisely because the emphasis is on deciding and executing rather than improving and teaching. A key aspect of learning through the PDCA cycle is to Plan by defining problems as gaps between the current situation and the standard and to establish upfront a schedules of checks to make sure that the action considered does have the expected effects, and if not, why? Such data is often believed easy to find, but experience shows although information systems are rife with numbers, finding comparable, consistent data sets is extremely difficult unless is has been planned that way in the first place. Whether using the firm's existing measures (how come on time delivery is measured at 99.1 % although not one of the twenty trucks leaving today has exactly the containers the customer ordered in them?) or creating lean-specific indicators (lean indicators have to make sense at line level and then be aggregated up as best can be, whereas traditional measured tend to be defined at the top and then applied downwards), the lean transformation program needs to have a clear mechanism to link shop floor activities with budget challenges and targets.

Top executives who embark on the lean adventure tend to consider that their management practices and operational processes are mostly okay, and that lean will enable them to get rid of the pesky waste that can be seen here and there – clean up the act, so to speak. Inevitably, as they progress in their journey, they have to come to grips that lean is not simply a way to resolve a few deficits in the traditional way to run a business, but a completely news model of business management. The rewards are worth it, as the gap between lean enterprises and traditional mass companies is at least equal at what mass companies were to artisanship workshops – but the climb is steep, and the cost in sweat and tears high. For a senior manager, lean transformation means setting stretch objectives, grappling personally with just-in-time processes and working daily at changing one management's style from decide-and-control to improve-and-teach, much like Tiger Woods choosing to completely rework

his swing at the peak of his glory. Successful lean transformation programs are those that will be designed around lean principles rather than traditional models of change management. And transformation is only the start. In a speech in Traverse City a few years ago, Toyota's then President Fujio Cho said the company, even with soaring sales and profits, needed to reinvent itself to remain successful in the ultra-competitive automotive marketplace – apply kaizen to the full enterprise. "If you are not busy reinventing your company, I guarantee you are falling backwards," Mr. Cho said. "Even worse, your customers are probably looking elsewhere."