**GEMBA WALKS**

*By Jim Womack*

**Take-Aways**

1. Gemba : The place – any place in any organization – where humans create value. But how do we make it a better place – one where we can create more value with less waste, variation, and overburden? Pgxix (*Introduction*)
2. “*Go see, ask why, show respect*.” I’ve always know these steps intuitively, even when I labored in the university world where it seemed natural to learn by gathering data at arm’s length and then evaluating it in an office through the lens of theory. Pgxix (*Introduction*)
3. I learned long ago that the most productive way to Gemba walk, is to follow a single product family or product design or customer-facing process from start to finish. As I do this I look at each step with the eye of the customer and from the perspective of those actually creating value, asking how more can be achieved with less. Pgxix (*Introduction*)
4. I always start by asking about customer purpose. What do your customers want that you are not currently able to supply? A lean “purpose” always has two aspects : what do you need to do better to truly satisfy your customers, and what do you need to do to better survive and prosper as an organization? You must know precisely what the gap is between what your customer wants and what you are currently able to deliver. Pg3
5. So start with purpose, defined both for you and your customer. Then ask about the gap between where you are and where you need to be. Pg3
6. A “process”, as I use this term, is simply a value stream – all of the actions required to go from start to finish in responding to a customer, plus the information controlling these actions. Pg5
7. Remember that all value is the end result of some process, and that processes can only produce what they are designed to produce – never something better and often something worse. Pg5
8. Value stream maps of the current state are the most useful tool for evaluating the state of any process. The map must detail every step, in order to help us to determine if it is :
   1. Valuable
   2. Capable
   3. Available
   4. Adequate
   5. Flexible Pg5
9. They should also show whether value flows smoothly from one step to the next at the pull of the customer after appropriate leveling of demand. Pg5
10. My formula for evaluating lean efforts is simple, but must be done in this order :
    1. Test and know your **purpose**
    2. Analyze and improve your **process**
    3. Engage and validate your **people** Pg7
11. I have long felt that a great weakness of the lean movement is that we tend to take customer value as a given, asking how we can provide more value as ***we currently define it***. But what if the customer wants something fundamentally different from what our organization is now providing? Pg9
12. Here are some simple principles for lean consumption that every organization providing services or goods should consider :
    1. **Solve the customer’s problem completely, by insuring that everything works the first time**.
    2. **Don’t waste the consumer’s time**.
    3. **Provide exactly what the customer wants**. The level of out-of-stocksof the right items and overstocks of the wrong items is remarkably high in almost every aspect of business. These consumer frustrations are almost completely avoidable with lean replenishment systems utilizing pull principles.
    4. **Provide value where the customer wants**.
    5. **Provide value when the customer wants**.
    6. **Reduce the number of problems customers need to solve**. Pg13
13. Your organizations purpose? “*What does your organization do to solve your customers’ problems better than your competitors, so that customers old and new, will pay good money for your products and buy more over time?*” Pg15
14. Customers only care about a company solving their problems along life’s path. Pg17
15. A key objective of the lean movement is to teach everyone to untangle intermingled processes in order to see clearly the specific process that they manage or touch as it flows from start to finish. Then, with a clear understanding of the current state of this process, they must improve its performance so that everyone is better off – customer, employee, supplier, investor. Doing this requires a method. Pg19
16. TEN QUESTIONS that Jim Womack (*the author*) would always ask from a companies’ Gemba walk – while following a single product family, and its process value stream :
    1. What are the business issues with this product? Inadequate ROI? Poor quality? Inability to meet customer ship dates? Inflexibility in the face of volatile markets? If a firm doesn’t know what its business issues are, how is it going to know what to improve?
    2. Who is responsible for the value stream for this product? If no one is responsible for anything, and everyone is responsible for everything, how can the firm improve?
    3. How are orders from the customer received?
    4. Where is the pacemaker process, (*the* *pacemaker process is the process in the lean value stream that is directly controlled by the customer's order. The pacemaker process sets the “pace” for all processes upstream of it in the lean value stream*), triggered by these customer orders?
    5. How capable, available, adequate, and waste-free are assembly activities?
    6. How capable, available, adequate, and waste-free are the fabrication activities feeding assembly?
    7. How are orders transmitted up the value stream from the pacemaker process?
    8. How are materials supplied to the assembly and fabrication processes?
    9. How are materials obtained from upstream suppliers?
    10. How are employees trained in lean procedures and motivated to apply them?

After a 30 minute walk to answer the 10 questions, I knew everything that I needed to be able to tell the senior managers just where they stood regarding their progress toward a truly lean production system. While we had looked at only one value stream, I knew from long experience that the issues we found would be present in every other value stream as well. Pg21-23

1. When conducting a Gemba walk, I always assume that in most companies the process steps in a typical value stream are sufficiently stable. By “***stable***” I mean that each process step is “***capable***” - able to produce a good outcome every time that it operates. I also mean that each process step is “**available**” *– able to operate every time that it is needed. Capability and availability in combination provide what I call “basic stability*”. Pg32
2. Even global companies with house-hold names that claim to be well down the path to lean production, have complex machines with operational availability below 60%, and sometimes as low as 40%. And many of the items they produce contain defects and require considerable rework, both within and at the end of the process. With stability this low, trying to introduce continuous flow by linking steps and connecting areas of flow with pull systems, is certain to be an exercise in frustration. Pg33
3. Inadequate stability traces to six types of problems :
   1. Downtime, when a process won’t run at all. (*Also termed major breakdowns or major stoppages*).
   2. Changeover time to convert from one product to the next.
   3. Minor stoppages of just a few seconds.
   4. Cycle time fluctuation, when a process takes longer than planned.
   5. Scrap, meaning some production is lost.
   6. Rework, in which parts must be run through the process again, reducing the time available for new parts.
4. If I were writing this essay today, I would discuss all four of the M’s needed to create basic stability :
5. Machine
6. Man
7. Method
8. Materials Pg35
9. When I first started studying the Toyota Production System, I was struck by something very simple – it’s utter precision. Nothing seemed to happen by chance, and continuous improvement was easier because the base condition was visible to everyone. Pg36
10. If the heart of the Toyota Production System is precision, and if more managers say they embrace this system, why has there been so little movement toward precise processes? The biggest problem is that most managers still don’t appreciate the need to get every step in every process precisely specified and conducted correctly every time. And even if they do, this seems too hard to achieve all at once. So managers tackle precision at specific points in the process in hopes that kaizen on each point will gradually lead the complete process from chaos to order. *The problem in my experience - is that they will never get there*…
11. Six simple principles of lean information management : Pg41-42
    1. Simplify every process to minimize your need for information management. (*For example : the simple act of moving activities from departments to a continuous-flow layout – in which an item goes automatically from one step to the next – eliminates all of the information needed to tell each department and step what to do next*).
    2. Make every step in your processes capable and available.
    3. Schedule each value stream from only one point.
    4. Use a reflexive production control upstream from the scheduling point.
    5. Send information in small batches.
    6. Make your information management transparent and intuitive.
12. I’m not naïve about getting the world to embrace lean information management. It seems as though we just can’t stop thinking that more information is always better, and that life would be so much easier if we just had complete data, perfect algorithms, and lightning-fast central processors - despite 50 years of evidence to the contrary! Pg43
13. My question was, “***Why do you need so much inventory with so many storage locations? If you have only one storage location for each item – on the shelf where the customer puts the item in the cart – and replenish every item every night from a central distribution facility serving many stores, the information you already gather from bar codes at customer checkout will tell you everything that you need to know***.” Pg43
14. My prediction is that as the amount of available RFID (*radio-frequency identification*) information overwhelms our ability as managers to figure out what to do with it, (*even as our fundamental value-creating processes deteriorate*). Eventually, many managers will begin to realize that simple is best. In the meantime, lean thinkers can save themselves enormous sums and frustration, by avoiding the latest IT wave and implement instead the six simple principles of lean information technology. Pg44
15. People must be engaged in understanding and improving the processes that create value desired by the customer if organizational and customer purposes are to be achieved. But how can we as leaders and managers engage them? I begin with a simple observation that we are all involved in processes in everything we do in life, whether as producers or consumers. And we often react badly – that is, we become negatively engaged – when we encounter defective processes with no apparent means to improve them. The question is, how can we focus on improving the broken process, rather than simply blaming each other? Pg49
16. What I find fascinating is that when good people (*that’s you and me*), are put in a bad process, we often become “bad” like the process – mean spirited, verbally abusive, and even physically aggressive. Ask everyone involved about the nature of the problem and they are very likely to blame everyone else – rather than step back and think about the process itself and how it could be improved. Pg53
17. Vilfredo Pareto’s (*1848-1923*) first statement of the 80/20 rule was based on his research indicating that throughout history, 80% of the wealth in societies was controlled by 20% of the population. Joseph Juran later (*1941*) extended the 80/20 rule to quality problems where he found that 80% of a problem is typically produced by 20% of the possible causes. Pg55
18. Pareto had a second insight with direct relevance to what I saw on my Gemba walks. This was his concept of economic optimality, which states that any proposed action in society (*for example, a new law*), should be judged in a positive light when no one is worse off and some individuals and organizations are better off. And achieving this by transferring some of the winners’ gains to compensate losers (*creating Pareto Optimality if it was not otherwise present*), also made such policies much more feasible politically because potential losers were much less likely to resist change. Pg56
19. As I look at these and the many other businesses I encounter on my walks, I see three problems apparently unnoticed by the heroic leader at the top rolling out the latest revitalization program. These are :
    1. Confusion about the business purpose of the organization’s core processes.
    2. Poorly performing product and process development, fulfillment, supplier management, and customer support processes that tend to get worse instead of better.
    3. Dispirited people operating these broken processes at every level of the enterprise. Pg59
20. Instead of more “heroes” in leadership, what’s needed instead? More farmers! The job of the hero is to tackle a situation in which everything is out of control and to quickly impose some semblance of order. Instead, every important process should be steadily tended by a “farmer”, (*a value-stream manager*), who continually asks three simple questions :
    1. Is the business purpose of the process correctly defined?
    2. Is action steadily being taken to create value, flow, and pull in every step in the process – while taking out waste?
    3. Are all the people touching the process actively engaged in making it better? Pg60
21. Why do we have so many heroes, so few farmers, and such poor results in our organizations? Because we’re blind to the simple fact that business heroes usually fail to transform businesses. They create short-term improvement, at least on the official metrics. But these gains either aren’t real or they can’t be sustained, because no farmers are put in place to tend the fields. Pg61
22. Farmers are the folks who provide the steady-paced continuity at the core of every lean enterprise. I hope that you can develop more lean farmers – individuals who take responsibility for the processes they touch, and the work they do every day. Plowing the straight furrow, mending the fence, and obsessing about the weather, are the real value-creating aspects of management. When present they insure that no heroes will be needed in the future. Pg61
23. When describing how to introduce the Toyota Production System, a presenter would usually reply : “*start by analyzing the work to be done*”. This means listing all the actions required to create value in a given process and then dividing these actions into three categories :
    1. **Value-Creating Work**. Activities adding directly to the value of the product as determined by the customer. A simple test is to ask whether customers would mind if this work was not done; and the product still performed properly. If they would mind, it is value-creating.
    2. **Incidental Work**. Activities that are currently necessary to create a product for a customer, but seems to have no other value to the customer.
    3. **Waste**. Activities that create no value, and can be completely eliminated. Pg63
24. Over time, I have come to realize that engaging in the problem-solving process with an employee, is actually the highest form of respect. The manger is saying to the employee, that he can’t solve the problem alone, because the manager isn’t close enough to the problem to know all the facts. The manager truly respects the employee’s knowledge and their dedication to finding the best answer. But the employee cannot solve the problem alone either, because he is often too close to the issue to see it in context, and may refrain from asking the tough questions regarding his own work. Only by showing mutual respect – each for the other, and for each other’s role – is it possible to solve problems, make work more satisfying, and move organizational performance to an ever-higher level. Pg68
25. In “*The Machine That Changed the World*” in 1990, Dan Jones, Dan Roos, and Jim Womak made the case that lean thinking can be applied by any company anywhere in the world, but that the full power of the system is only realized when it is applied to all elements of the enterprise. As this view became accepted, the focus turned to how organizations everywhere could transform themselves from mass producers into lean leaders. Pg75
26. The question for all value stream managers to ask is, “How can I make customers happy, while making money, by engaging the full energies of our people, to improve this value stream”. Pg79
27. If managers focus on their processes, the performance metrics will inevitably come out right; but if managers focus on their numbers, the processes are likely to never improve. Pg80
28. Just as a carpenter needs a vision of what to build in order to get full benefit of a hammer, we need a clear vision of our organizational objectives and better management methods – indeed, lean management – before we pick up our tools. Pg80
29. Tips for deploying W. Edwards Demming’s “Plan/Do/Check /Act” strategy :
    1. The P (**Plan**) part is usually very simple, but it’s critically important that as you start you reach agreement on where the organization really stands - it’s current state. This means developing simple, visual measures of current performance that everyone can see and agree upon. Otherwise the plan is based upon illusion.
    2. The D (**Do**) part will succeed if the plan tells a simple, persuasive story, and each element of the plan is easily understandable to everyone.
    3. The C (**Check**) part of the plan is critical and is almost universally ignored. Yet, there is no point in deploying a plan unless there is a standardized method for measuring the results and senior–management commitment to follow-through.
    4. The A (**Act/Adjust**) step is equally important but requires effective problem-solving to understand why the plan is not achieving its intended results. Even organizations that check their progress are usually weak at adjusting. Yet, almost no plan produces exactly the results expected. Adjustment is inevitable and continual. Pg85
30. It’s all about people. This means that employees are actively engaged at every level in ensuring that process technology – no matter how sophisticated – works properly with properly trained and supported employees to produce a good result every time. Everyone in the organization needs to become a scientist, participating in continual experiments with every plan element, by means of a PDCA. Pg86
31. I believe that the root cause of lean management regression in most organizations today, is confusion about priorities at different levels, compounded by the failure to make anyone responsible for the continuing performance of important value streams as they flow horizontally across the enterprise. Therefore, the responsible person must periodically revisit the value stream, not just to prevent regression, but to continually move it to a higher level of performance. Pg94
32. What every organization must do at some point, is to make the conversion from lean programs led by staffs, to deployment and problem solving by line managers. And the faster and more completely an organization makes this transition, the more successful it is likely to be. Pg100
33. As I walked through these organizations, I was sobered to realize that these lean management techniques had become merely lean management tools. They were being followed as organizational ritual without thinking about their actual purpose. Unfortunately, as so often happens in organizational life, means had become ends. I was not surprised. Tools – for process analysis and for management – are wonderful things. They are absolutely necessary. And managers love them because they seem to provide shortcuts to doing a better job. But they can’t achieve their potential results, without managers that possess a lean state of mind and the determination to consistently wield them. Pg103-104
34. What do I mean by a “lean state of mind”?
    1. First, the lean manager embraces the role of problem solver. This means going to see the actual situation, asking about the performance issue, seeking the root cause, and showing respect for lower-level managers and for colleagues at the same organizational level, by asking hard questions until good answers emerge. It’s this critical probing state of mind that permits lean tools to be put to good use. The lean manager applies the right tool for the specific problem and does this in context on the gemba, rather than in the abstract in some conference room. Empty ritual is replaced with a rigorous thought process that engages employees and pulls forward their best abilities.
    2. Second, the lean manager realizes that no manager at a higher level can, or should, solve a problem at a lower level. The lean law of organizational life is that problems can only be solved where they live, in conversation with the people who live with them, and whose current actions are contributing to the problem. But this requires support, encouragement, and yes, relentless focus from the higher-level lean manager.
    3. Third, the lean manager believes that all problem solving is about experimentation by means of Plan-Do-Check-Act. No one can know the answer before experiments are conducted, and the many experiments that fail – will yield valuable learning that can be applied to the next round of experiments.
    4. Finally, the lean manager knows that no problem is ever solved forever. Indeed, the introduction of a promising counter-measure is sure to create new problems at some other point in the organization. This is not bad. It is good – provided that the objective, probing mind of the lean manager, keeps on the case in pursuit of perfection. Pg104-105
35. Lean managers create value and do useful work through four types of actions :
    1. Gaining agreement on the few important things the organization needs to do. This means focusing on how the organization can dramatically improve its ability to create more value, with less time, effort, waste, investment and errors.
    2. Deploying the few important initiatives selected by strategy deployment, solving problems as they arise using the A3 and PDCA cyle, and evaluating proposals from lower levels of the organization.
    3. Stabilizing the organization. This means making every step in every process capable, adequate, and flexible – so that the value stream can flow smoothly from end to end, and improvements can be sustained.
    4. Creating the next generation of lean managers. This is perhaps the most important work of every manager at every level, and can only be created by intense dialogue between mentors and problem owners through many cycles of gemba learning. Pg114
36. I have concluded that the greatest impediment to the successful introduction of lean thinking, is the modern management system that was pioneered in the 20th century by General Motors and adopted by most organizations. Here is a simple comparison with the Toyota lean management system : Pg116

**MODERN**

Authority

Results

Give Answers

Plans

Formal Education

Staffs Improve Processes

Decisions Made Remotely w/Data

Standardization by Staffs

Go Fast to Go Slow

Vertical Focus

**LEAN**

Responsibility

Process

Ask Questions

Experiments

Gemba Learning

Front Line/Teams Improve Processes

Decisions Made on Gemba w/Facts

Standardizations by Front Line/Team

Go Slow to Go Fast

Horizontal Focus

1. ***The uncoupling of responsibility from authority, is perhaps the most important idea I have learned from John Shook*** (*LEI author of “Managing to Learn”*), who learned it during his years as a manager at Toyota. The method that lean managers use to lead without authority is A3 analysis. As they work through the problem, the root cause, and the best countermeasures, in dialogue with everyone touching the process, they “*manufacture*” the authority for making sustainable improvements. Pg117
2. ***Modern managers manage by results***, to make their efforts look effective at the end of some reporting period (*when problems have already occurred*). Unfortunately, there has never been a metric invented that can’t be gamed in some way to make the results look better than they really are. As a car dealer once told me about the customer satisfaction metric used by the car company supplying his vehicles, “*It’s a lot easier to fix the score than to fix the store – so that’s what I do, and I’ve been very successful*.”
3. **Lean managers manage by process**, by knowing at all times the condition of their process (*which produces the results*), so that problems can be solved and improvements implemented before, rather than after the fact.
4. Modern managers give answers to their direct reports about the nature of a problem and its solutions. Lean Managers pose questions to their problem owners about the nature of the problem and the best available countermeasures. Doing this automatically transfers responsibility for the problem from the higher to the lower-level manager, who is closer to the problem. In authority-based management, the higher level manager maintains the illusion of being in control and accepts responsibility for the subordinates’ results, even though the best thing to do is usually impossible for the higher-level manager to know. Pg119
5. Modern managers go fast to go slow – because problems are never fully understood and the quick countermeasures put in place don’t (*and in fact, can’t*) address the real issue, leading to time-consuming rework. Lean managers go slow to go fast – by taking time to fully understand the process and its purpose, through dialogue with everyone involved (*often including the customer and the suppliers*), and by fully understanding the root cause of the problem and the most promising countermeasure before taking action. Pg122
6. Since childhood I’ve had friends and colleagues who were “*fast studies*”, seemingly able to analyze problems and take action much faster than I ever could. Then it dawned on me, that those “*jackrabbits*” were mainly fast at driving into ditches - because they never understood the problem with a process or even its purpose. They were jumping to solutions and then moving on before the results could even be evaluated. Pg122
7. “*Whether you think you can, or whether you think you can’t – you’re right!*” Henry Ford
8. The first of Dr. W. Edwards Deming’s “*14 Points*” is to “*create constancy of purpose for continually improvement of products and services to society*”. Pg159
9. I realized again that if strategy deployment isn’t driving you crazy, you aren’t doing strategy deployment. This is because the whole idea is to flesh out for resolution the contradictions and conflicts between value streams and functions that remain well-hidden in most organizations. Pg162
10. Recently, I’ve begun thinking about broadening the focus of the lean movement to include the entire range of business processes. I hadn’t pursued this before because of horrible memories of business process reengineering. This consulting phenomenon came roaring through North America and Europe during the recession of 1991-92, when many big companies were desperate to cut costs at least as fast as sales were falling. The idea – as popularized by Michael Hammer and James Champy in the best-seller “***Reengineering the Corporation***” – was for special teams of process reengineers (*often lead by outside consultants*), to analyze key processes, identify the waste, and quickly remove it to create smoothly flowing processes at much lower cost. The problem was that most reengineers lacked a credible method or any experience, and they gained little cooperation with employees. In the end, many employees were laid off to meet consultant promises to management for almost instant paybacks on investment. But few processes were successfully reengineered. Lean aims to improve processes the right way - using a rigorous method and with employee buy-in. Pg174
11. I find that following the stream all the way to the end customer is often the greatest challenge, because the closer we get to them, confusion about value and purpose becomes more important and apparent. Pg181
12. Today I see a lot of progress in applying lean thinking to segments of value streams, even across functions within firms. Take the case of motor vehicles… As customers, we want to obtain a physical object called a car or a truck. But the real problem we are usually trying to solve is personal mobility. We want to get places cost-effectively with no hassle or wasted time. So the process of buying the vehicle and then keeping it running through an extended life are critical parts of the **complete** value stream. This total stream must link the car manufacturer’s design and production process, to the car dealer’s sales and service process. Pg182
13. In sum, Toyota solves half the customer’s problem by delivering high-quality vehicles. But it has been ranked by JD Powers and Associates in Customer Sales Satisfaction as 29th out of 37 brands (*interestingly, their luxury brand Lexus, is ranked #1*). Obviously, Toyota is still struggling to solve the whole problem by perfecting the entire value system of the vehicle, plus sales, plus service. Pg183
14. **These are simple ideas** : ask what the customer truly values and where the waste lies preventing the provision of this value. Then rethink operating methods and staff roles. (*Purpose, then Process, then People!*)… **It’s amazing how easy lean thinking can be, if only managers can forget about their existing assets and traditional methods for a moment – and give themselves the freedom to dream!** Pg196
15. At the Mayo Clinic, I found brilliant doctors who were point optimizers, focusing solely on their narrow activity without much thought (*or patience*) for how it meshed with the other activities around them. The hospital administrators, by contrast, were asset optimizers, trying to keep every machine, room, nurse, and specialist busy – even if this meant delays for patients and heavy burdens for staff. They were all scrambling, trying intuitively and reactively to somehow keep things moving. However, they lacked recognition of the importance of their tasks and a rigorous methodology. Together, these brilliant doctors, diligent administrators, and long-suffering nurses were providing healthcare that cost too much, took too long, and often produced less than optimal outcomes. To make a lean leap, everyone in the organization would need to change their way of thinking and acting. Pg198
16. My prescription for the Mayo Clinic was simple : identify all the major patient (*customer*) pathways, as well as all the support streams, and map them end-to-end. Then ask how each pathway could be cleared of its blockages, backflows, and cul-de-sacs – for the benefit of the hospital, its staff, and its patients. Finally, and most important, ask what changes in management would be required to keep the pathways clear. Pg199
17. But I’m concerned that we will stop short, content to settle for single-pathway interventions. I’m worried that improvements in individual pathways can’t be sustained because the organizations in which they reside have not changed. What the patient – the whole healthcare system – really needs, is to rethink management and leadership, so that we can truly create and sustain lean healthcare. Pg201
18. “***Humans will try anything easy that doesn’t work, before they will try anything hard that does work***.” Pg204
19. This is a small-scale, but still satisfying, example of applying process thinking to the world’s work. But what was really striking to me, was how easy it was to create a relatively lean process almost instantly. The reason was that no inappropriate assets and no mangers and work team with carefully learned bad habits stood in the way. Why can’t it always be this way? Pg209
20. My colleague John Shook has been very articulate in observing that Toyota from its beginnings always wanted to be the best at solving customer problems, using the least resources necessary – so that it could survive. Pg224
21. The simplest definition of lean is : “Create more value, with less of everything”. Pg227
22. What are the performance attributes of a Toyota/Honda-style production system? It:
    1. Needed less human effort to design, make, and service products.
    2. Required less investment for a given amount of production capacity.
    3. Created products with fewer delivery defects and fewer in-process turnbacks.
    4. Utilized fewer suppliers with higher skills.
    5. Went from concept to launch, order to delivery, and problem to repair in less time with less human effort.
    6. Could cost-effectively produce products in lower volume with wider variety to sustain pricing in the market while growing share.
    7. Needed less inventory at every step from order to delivery and in the service system.
    8. Caused fewer employee injuries. Pg230
23. At its essence, here’s what “lean” means to Jim Womak :
    1. It always begins with the customer.
    2. The customer wants value : the right good or service at the right time, place, and price, with perfect quality to solve their problem.
    3. Value in any activity – goods, services, or some combination – is always the end result of a process (*design, manufacture, and service for external customers, and business processes for internal customers*).
    4. Every process consists of a series of steps that need to be taken properly and in the proper sequence at the proper time.
    5. To maximize customer value, these steps must be taken with zero waste (*the “7 Wastes” include : overproduction, waiting, excess conveyance, extra processing, excessive inventory, unnecessary motion, and defects requiring rework or scrap*).
    6. To achieve zero waste, every step in a value-creating process must be valuable, capable, available, adequate, and flexible, and the steps must flow smoothly and quickly from one to the next at the pull of the downstream customer.
    7. A truly lean process is a perfect process : perfectly satisfying the customer’s desire for value with zero waste.
    8. None of us has ever seen a perfect process, nor will most of us ever see one. But lean thinkers still believe in perfection – the never-ending journey toward the truly lean process. Pg232
24. What is JIT? It’s a simple idea formulated by Kiichito Toyoda at Toyota in the late-1930’s. Each step in a value stream should pull precisely what it currently needs from the previous step in the value stream. This pull should be the signal for the previous step to immediately make new items to exactly replace those just withdrawn. Pg238
25. Toyota implemented its pull system by means of simple rules. One was that between every step in a value stream it is critical to accurately calculate standard inventory. This is the amount of material that must be in place so that the downstream customer is never disappointed. This inventory consists of three elements :
    1. **Buffer Stock**. Goods already finished and kept on hand to deal with sudden spikes in demand from the downstream customer.
    2. **Safety Stock**. Finished items or raw materials maintained to protect the output of the process if upstream suppliers fail to respond to the pull signal in a timely manner or if the process itself encounters problems – like bad product or broken equipment.
    3. **Shipping Stock**. Goods being built up for the next shipment. Pg238
26. “*Without doing lean math at the beginning of process improvement activities, it is easy to improve the wrong things in the wrong places*”. Pg242
27. “***Never put lean purity ahead of what’s realistic or what the customer wants***”. Pg263
28. Fixing operations through “lean” may not be sufficient to save a company, if managers wait too late to start the process, and factor costs (*principally wages and healthcare costs*) are too far out of line. Pg270
29. Sustainable advantages lie in combining truly lean practices in product design, operations and logistics, purchasing, and customer touch - with appropriate labor costs, at the right location, to serve specific customers. Pg271
30. A lean enterprise consists of five elements :
    1. A product development process
    2. A supplier management process
    3. A customer support process
    4. An overarching enterprise management process
    5. A production process – from order to fulfillment Pg276
31. A lean management system involves managers at every level framing the key problems that need to be solved and asking the teams they lead to discover and implement the answers. This practice of asking the correct questions rather than providing the correct answers (which high-level bosses can never know in any case), is perhaps the starkest contrast between lean thinking and orthodox modern management and the hardest to remedy. Pg277
32. Toyota learned when it went bankrupt in 1950 and fired a quarter of its workforce, that no company in a truly competitive industry can make promises to employees (*or retirees*), that are not sustainable in the market. So Toyota made a deal: right-size the company at one go, tie compensation and benefits to market conditions (with bonuses of all employees geared to profits and with defined-contribution pensions), and try very hard to defend every employee willing to embrace the new value-creating system. As a result, everyone at Toyota understands that continuing employment with good compensation depends upon continually creating more value per employee. That’s why everyone worries and thinks so much about continually improving every process. “Life-time employment” is a consequence of creating value, not a precondition or an entitlement. Pg279
33. The historical record is clear : Henry Ford was the world’s first systematic lean thinker. His mind naturally focused on the value-creating process rather than assets or organizations. And he was the first to see in his mind’s eye the flow of value from start to finish, from concept to launch, and from raw material to customer. In additions, Ford was history’s most ferocious enemy of waste. Ford relentlessly emphasized the need to analyze every step in every process to see if it created value before finding a better way to do it better. Otherwise, the step would be eliminated. Pg281
34. Taiichi Ohno claimed that he learned what to do at Toyota from reading Henry Ford’s books. Pg281
35. What does Toyota need to teach its new lean managers? To utilize the concept of going to the Gemba. There, they need to ask questions about the true business problem, the current condition causing the problem, a better condition (*that is, a better process*) that could address the problem, who must do what when to achieve this new condition (*the future state*), and what evidence will show that the problem has been addressed. Pg290
36. Issuing crisp orders is the natural instinct of any boss. Indeed, most bosses seem to think that by the virtue of their experience and authority, they should be able to solve any problem lower in the organization. But orders from the boss, rather than informed questions, take away the lower-level managers’ responsibility for solving problems. They start a vicious circle in which lower-level managers wait to be told what to do by higher-level managers who are much further from the Gemba (*where value is created*), and who inherently have less – not more – knowledge of the best thing to do. Pg291
37. In the early 1990’s, the business process reengineering movement tried, but mostly failed, to transfer the concepts of standardized work and continuous flow to the office and service processes that now constitute the great bulk of human activities. Pg305
38. When embarking upon a lean project… “*Determine the right destination – before you start the journey*.” Unfrotunately, the reason the journey takes so long for most organizations, is that they have no clear agreement on just what the right destination is. And in particular, they make no connection between meeting the customer and business needs of the organization (*the true purpose of any process improvement*), and the right sequence of steps to take. Pg310-11
39. The key trick, as I now understand, is to pick an initial destination – an improvement in the performance of a key process, that will permit the organization to prosper by addressing the customer’s needs. Once that destination is reached, it’s time to pick another, further along the path toward perfection, that materially benefits the organization. And so on… Pg311
40. A small band of Toyota managers brought to NUMMI (the joint GM/Toyota experiment at the Telsa factory in Freemont, California), from Toyota City in Japan, a system that was truly systematic, visible, and easy to copy : a standard terminology, and a methodical approach to human relations – with a new, proactive role for teams, team leaders, and front-line management. It also included a focus on problem-solving and continuous improvement, (*rather than fault-finding and the status quo*), and all of the support apparatus to handle the information and material in order to create a smooth flow of value from end-to-end. Pg319-20
41. John Sloan, in a 2010 article in the Sloan Management Review, explained how NUMMI showed the best way to change and to sustain an organizational culture - by first changing and sustaining management behavior. It is a lesson that many transformation efforts still overlook. Pg321
42. “*No one who has tried to create a complete lean enterprise with hands-on participation of top management has failed to achieve dramatic results*.” Pg322
43. FINAL POINTS TO CONSIDER
    1. Never stop rediscovering the power of “*going to see*”.
    2. Never walk alone. Walk with the people who touch the value stream.
    3. Expand your focus. Reflect first on the purpose of the process, before focusing intently upon the process itself.
    4. Pay special attention to the way people are engaged in the process operation and improvement.
    5. Increasingly, I focus on what problem the customer is trying to solve in their life, and I ask whether the existing process, no matter how well run, can effectively address this problem. Indeed, could the value stream be entirely rethought to produce something quite different?
    6. Similarly, I now focus on how the process feels from the standpoint of those operating it, and how better process must be combined with more fulfilling work.
    7. “*Where there is no standard, there can be no kaizen*.” Taichi Ohno
    8. I have learned to give the same attention to purpose and people, that I give to the process itself. Pg325-29
44. I am confident that we will continue to progress as a community, as long as we continue four simple practices :
    1. Conduct rigorous experiments
    2. Openly share our results
    3. Perform periodic hansei (*self-reflection, acknowledge one's own mistake and to pledge improvement*).
    4. And take Gemba walks together!