

# Implementing Lean Thinking

## An Interview with William C. Kessler



William C. Kessler is Vice President, Enterprise Productivity, Lockheed Martin Aeronautical Systems. Prior to joining Lockheed Martin, Dr. Kessler was a senior executive with the Air Force and Director, Air Force Manufacturing Technology and Industrial Base Assessment. He received his Ph.D. in chemical engineering from Washington University.

**IKSM:** How is “lean” defined and what does it imply in large aerospace enterprises like Lockheed Martin Aeronautical Systems (LMAS)? How would your answer likely differ for a company selling computers, cell phones, or consumer software?

**Kessler:** The meaning of the word “lean” has evolved over the years since it was coined by the MIT authors of the book “The Machine that Changed the World” in the early 90’s. At that point the discussion was around lean production and specifically the collection of best practices that Toyota used in the realization of their products. In the US, there was confusion over the word production in conjunction with lean. Many missed the point that lean referred to the entire enterprise — shop floor to the board room and including suppliers, partners and customers — and not just to the factory floor. Even the phrase lean enterprise became confusing to some and Jim Womack did a very good job of clearing up a lot of the confusion in his book “Lean Thinking”.

To most of us, lean thinking refers to an absolute focus on getting rid of all waste in our processes and practices that are used in the delivery of value to our customers. So, in thinking lean, you must always start with knowing what the customer values. Next you must understand your processes for delivering value to that customer. Third, you must relentlessly get rid of waste in the value stream — this waste is generally found in the way work gets done. Then you move onto allowing the customer to “pull” value on demand and start to focus on perfection through continuous and incremental improvement.

In my view, the word “lean” was an unfortunate choice. The word generally congers up the notion of cutbacks and layoffs. In actual practice lean will mean more in some areas — more investment in all the employees to give them the skills they need to do the work, more business for the company as the company is able to be more competitive, and so on. Lean thinking improves an organization’s competitiveness. Often times, however, organizations do not move to lean thinking until they are in a situation where they are already losing market and customers — thus they apply lean thinking as folks are going out the door due to past business practices.

Lean thinking, or the relentless focus on getting rid of waste in our work practices, applies in different ways to organizations that are at different points along the never ending lean journey.

For example, at LMAS — a typical defense aircraft manufacturing facility — we are putting in the foundation of lean thinking. Simple notions like gaining the President's support, aligning the senior management, investing in the required training, achieving visible demonstrations of success, and getting the work force engaged have been underway for the past 18 months. We have achieved eye-watering results in breaking the past paradigm of our batch and queue mentality in the factory and moving to single piece flow in cellular manufacturing. At our position on the lean thinking journey, these early internal successes are helping us understand the power of lean thinking and now we have the confidence to drive lean across our entire enterprise. We had a long history of establishing work practices that met the defense customer requirements of the cold war era — profit was based primarily on cost, cost was “inspected in” by the customer auditors, and we became very good at justifying cost. All that has changed. The Defense customer has relieved us of many of those past requirements. Now we have the obligation and opportunity to apply lean thinking to provide value to a customer who wants both technical and financial performance.

Other companies who manufacture personal computers and cell phones and the like are at an entirely different point in the lean thinking journey. They have defined what the customer values and they know the processes they must use to deliver the value. They are well down the path of eliminating all waste in these processes — particularly with their supplier base where suppliers have access electronically and instantaneously to the data they need to support the prime. These more mature lean thinking firms are taking customer orders and allowing these orders to “pull” the manufacturing process. Furthermore, these firms are well down the path using continuous improvement strategies. These firms that are further down the lean thinking path are more focused on information systems that provide needed data and information exactly where it is required. They are focused on continually interacting with their customer base to be sensitive to any changing customer value. They are focused on the human capital side to make their employees of greater and greater value.

Whatever we choose to call the philosophy or methodology of lean thinking, my belief is that it is a never-ending journey. Organizations are focused at different targets, depending on what they need at the time. The good news for those of us in the early stages is that we can always look at what other organizations are doing in other sectors and adapt it and improve it to accelerate our journey.

**IKSM:** Some commentators in this area have argued that lean is just the starting point. The next step is “agile,” in the sense of being able and willing to adapt quickly to market changes, technology opportunities, etc. Do you agree with this distinction? Is it possible to be lean and not agile? How does the speed of adaptation depend on your type of business?

**Kessler:** No, I don't agree on the distinctions. Such distinctions are generally brought forth by individuals or groups to try to highlight, or promote, a sense of something new. Although this may be helpful to some, it is generally a confusion factor within an organization in the midst of implementing change.

In my understanding, the word “agile” is meant to describe the practices of using information technology and networking to allow a company to establish partners and suppliers in very rapid order to respond to customer opportunities. The folks who promote “lean” will describe their fundamental principles around knowing customer value, defining the processes that flow the value to the customer, and making value flow. In this sense, the “agile” practices are certainly an approach to allowing value to flow rapidly to the customer.

I think we make too much out of words like lean and agile. The important focus should be on describing the company's business system. The principles and practices that drive that business system are important. The principles of “lean thinking” are certainly a good place to start when

updating the business system. And the best practices used by companies that have successfully deployed lean and implemented agile are also valuable in establishing the business system. But keep the focus on the business system and not the “buzz” words.

It is certainly possible to be on the journey to lean and not yet have agile practices in place. However, the lean journey, as it progresses, will certainly embrace agile practices if they are appropriate in rapidly flowing value to your customer. Every industrial/service sector and each company within a sector will have a different journey to lean — we are all at different points and our internal culture and environment must also be considered. It seems quite logical that certain types of manufacturing/service companies would have a more pressing demand for agility practices than others. If a company embraces the lean thinking principles and realizes that they must flow value to customers rapidly they cannot ignore the need to incorporate such agile practices. Obviously, the question of how rapidly value has to flow to the customer must be addressed. The answer will be customer dependent. And the answer determines the urgency for rapid formation of partnerships and use of information technology and networking.

**IKSM:** Beyond lean and agile, some have asserted that the key is flexibility. In fact, if you are sufficiently flexible, some argue that you need not have a long-term strategy. You “simply” produce whatever customers are buying. For LMAS this might mean producing C-130s this year, railroad cars next year, heavy construction equipment after that, and then perhaps back to C-130s. Is it possible to be this lean, agile, and flexible?

**Kessler:** First, LMAS has a mission dealing with aeronautical systems solutions so we won’t be building railway cars in the near future. As we have been discussing, embracing lean principles — customer value focus, flow value to the customer, have customer pull the value — will lead to flexibility and responsiveness as part of the enterprise’s culture. In my view, flexibility is not another concept beyond lean and agile. Flexibility is a capability that can be achieved within a company’s business system if that system is built around lean principles.

More and more companies are debating how they can create new market space. This discussion has more support and interest within companies when this vision is built on creating new market space that is in some way connected to the existing intellectual and physical capability within the enterprise. For a company to make the leap into such a vision of new market space will require the company to possess the characteristic of flexibility.

**IKSM:** In the 1960–70s, the emphasis was Zero Defects. The 1970–80s saw Total Quality Management. The 1980–90s shifted the focus to Business Process Reengineering. More recently, we’ve had Balanced Scorecards, Open Book Management, Profit Zones, and so on. Does “lean” fit in this species, or is it a different kind of animal?

**Kessler:** I still have my “zero defect” pen that was handed out to publicize the activity — it never did work.

The list of management initiatives seems to never end. We continually want to feel like we are doing something new and proactive to be more competitive. However, many of these initiatives are very helpful if viewed within the context of improving our company business system. Business process reengineering is key to the implementation of lean principles. As you try to flow value rapidly to the customer, you will most likely find that the existing organizational structure is an impediment. A new focus on the vital processes that flow value rapidly and accurately will be needed. True process reengineering is often times the needed change. The “profit zone” reminds us to look for financial reward throughout the entire value stream and not just in our traditional niche. The

“balanced scorecard” can be a very useful tool to provide lead and lag indicators of key measures of our overall effectiveness in flowing value to the customer.

My point is that many of these management tools are very useful if they are important to the company business system improvement. If they aren’t linked to your business system, then they are probably distracting you. And by the way, they may not be relevant this year but they might be very important in a year or two when you are further along the lean journey.

**IKSM:** You’ve clarified why lean thinking is so important and where it fits into an overall philosophical business framework. If it makes so much sense, why doesn’t everybody do it? Are there some fundamental hurdles that many companies find too difficult to surmount?

**Kessler:** Of course every company is doing some “lean thinking” as they operate their business system. A significant number of companies have institutionalized lean thinking as a way of doing business and place their efforts now on higher order aspects of improving their business system.

Companies like ours, Lockheed Martin Aeronautical Systems, are early on the quest of deploying and institutionalization of lean thinking and there are tremendous barriers to overcome. Any change process that drives at changing a long established culture of an institution will meet with great resistance. First, the change is not even possible unless the top leadership are committed to the change and willing to support the change with clear and compelling rationale. Second, you must recognize that the existing staff is already very busy — often times spending tremendous time and energy on those same topics that you want to “fix”. Thus, it is necessary to establish a small group that works directly with the president and senior staff on strategizing and provisioning the change process. Third, you must be prepared to find the right consultants, hire some experts that have implemented similar change with other companies, and you must invest in the development of your people — profound knowledge refers to getting the knowledge in the hands of the people doing the work.

These are a few of the barriers in just getting started. Once started, there are also impediments. The finance community will always challenge the investment in the people, the near term costs, and usually sit on the sidelines and ask why product costs aren’t dropping. Finance must buy into the overall process for capturing savings — this might be as simple as establishing a policy to drive overtime hours down to a few percent and obtaining agreements to reduce budgets by targeted amounts — that doesn’t drive the organization to its knees by trying to do a “business case return on investment” on every single productivity improvement project that is done. It is always interesting to see the amount of money we are willing to invest in product performance improvement and how little we want to invest in productivity improvement processes. There will also be some senior managers that just won’t change. They will have to be moved and that is why the president must absolutely be committed to the change. There are many more barriers in the implementation phase as well.

Of course in sustaining application of lean principles, you must capture the gains and never allow retreat. Furthermore, you must move into a continual improvement strategy and keep looking for major opportunities for incremental change. Those companies that have not started the journey yet have the biggest barriers to overcome. They must establish the compelling reason for change and find the internal leadership strength to get started.

**IKSM:** This sounds like a lot of hard work, also never-ending work to keep a competitive edge. Do incentive and rewards systems have to change to keep people motivated and energetic? If so, have companies that have not changed their incentive and reward systems encountered difficulties?

**Kessler:** Yes, I believe that they must change. However, I have not seen any research related to the linkage between incentives and the successful implementation of lean principles. From what I have

observed in the defense sector, the movement to lean principles really didn't start in a serious way until the defense customer started demanding more affordable products and meaning it.

Similarly, we see many of our suppliers who also were not moving out until we let them know that we were going to find other suppliers unless they moved on getting costs down. These "events" that wake up a company to the fact that they could lose substantial market if they don't change are the events that create the compelling reason for change.

Once started, however, the pace and value of the change is clearly tied to employee involvement. Once again incentives and rewards are the valuable tools that managers have to align employees with the change process. Investing in training and education related to the change process is probably the most valuable tool the manager has — you can't really expect the employees to implement change if they don't have the fundamental knowledge and skills.

Linking the executive and management compensation to performance in the area of change is important, and involves measuring both activities and results. A broader base set of incentives and rewards for all employees to participate are also very useful. This can range from non-monetary awards such as dinner certificates to actual monetary gain sharing and stock options. Each organization has to tailor these for themselves to fit what best incentivizes their employee population to get engaged.

**IKSM:** You certainly have made a compelling case for lean thinking. Despite the hard work, it seems that the marketplace is demanding lean and the results produced justify lean. Does this imply that, slowly but surely, everyone will adopt lean? Or, is the case only compelling for particular types of industries and companies?

**Kessler:** Lean principles are so basic that I suspect every company is doing some lean activities today. The question is really around the aggressiveness and breadth of the implementation. My view on adoption of lean is fairly simplistic. Companies start with a strategy to achieve a set of goals — this is fundamental. Goals are generally stated around market share and financial performance. If a compelling part of the company strategy deals with a critical need to attack costs, dramatically reduce cycle time and improve quality then the company will clearly need to aggressively implement lean principles. Not all companies, nor every industrial sector, have this need. However, most every company involved in defense procurement does have the compelling need. We do. A key part of our strategy, but not the only focus of our strategy, is an aggressive attack on improving quality, reducing cycle times and reducing costs. This translates into specific company objectives related to lean implementation and the results we expect to accomplish.

**IKSM:** We greatly appreciate your sharing these experiences and perceptions with our readers. We expect that the important topic of implementing lean thinking will continue to receive much attention in subsequent issues of the journal.