

Time to Six Sigma Lean Thinking!

ASQ Hamilton Chapter

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The Advent Of Lean Thinking

- Six Sigma dominated Quality and process improvement practice through the 1990s and first half of the last decade
- Based on D-M-A-I-C problem solving process to reduce defects by controlling variation
 - Brought process thinking to mainstream management & drove a Quality orientation throughout industry in North America
- Struggled due to a number of reasons
 - Bias towards statistical analysis, managers were not ready
 - The rigor became dogmatic and impractical
 - Everything became Six Sigma, not everything needed to be
- Lean was like a breathe of fresh air!
- Lean Thinking has preoccupied Quality and process improvement initiatives over the past decade – everyone is Value Stream Mapping!

Lean – Toyota's Story

- The outcome of a 5 year study of the global automotive industry detailed in Womack's book "The Machine That Changed The World"
- Focused on elimination of waste (Muda) to achieve Single Piece Flow through the End-To-End process
- Toyota's success is attributed to the 'Lean System'
 - Largest automotive manufacturer in the world
 - Widely regarded as the highest quality of automobiles; arguably in any manufacturing industry
 - Profitable every year for past 40 years
 - Market Capitalization (2013) - \$200B (General Motors - \$50B, Ford - \$68B, Honda - \$70B)
 - Leading innovation and speed to market (Led by Prius, Toyota has a 73% market share of hybrid cars sold in US)

Followers ... Still Far Behind

- Lean has been well understood; Toyota has been open to sharing their 'system'
- Studied by hundreds of academics; Toyota plants have been toured by hundreds of thousands of managers and executives (they offer daily free plant tours)
- Scores of books and academic papers published
- Innumerable Lean Experts promise Toyota-type results; demand for Lean training, Value Stream Mapping and Kaizen continues to grow exponentially
- Yet ... no company outside of Toyota's family of companies has been able to achieve their legendary results sustainably
- Worse still ... most Lean implementations fail to reach their goals and a large number fail altogether

The Logic of Lean Thinking

Why?

- To answer this question, let's understand the intention of Lean:

Focused on achieved Single Piece Flow

(This is the least expensive way to produce)

- Everything that impedes Single Piece Flow is termed Muda
- Through an iterative cycle of problem solving, Toyota found solutions to reduce Muda
- So, all Lean tools are simply Toyota's responses or solutions to their Muda problems

The 8 Types of Muda

8

Lost creativity

Good Ideas or solutions from employees, that are not implemented, lack of employee implication, etc.



Overproduction

Producing earlier, faster or in greater quantity than clients' demands.



Inventory

Raw material, work in progress or finished goods which we are not adding value to at the moment.

Processing

Useless operations, useless inspections, multiple rejections, multiple approvals, useless details, inappropriate processing (including environmental threats), etc.



Non quality

Not right the first time. Repetition or correction of the process.



6



3

Waiting

Waiting for response, information, equipment, raw material, etc.



5

Transportation

Useless transportation of people, documents or tools between two processes.



4

Motion

Useless movement of people, parts, documents or tools in the process.



Why Lean Needs Six Sigma

- Implementing Lean tools is like implementing Toyota's solutions to Toyota's problems
- Not detailed in the Lean Thinking body of knowledge is the Scientific Method of problem solving (Six Sigma); often overlooked in Lean implementations
- This is one of Toyota's core strengths:
 - team members are hired for this aptitude and undergoing extensive training in rapid PDCA and problem solving;
 - supervisors are selected on their ability to coach team members on problem solving
- It would seem that Lean is enabled by Six Sigma

Why?

1. Waste = Variation

- Most muda exists for 2 reasons:
 - Caused by Variation
 - Needed to overcome Variation issues
- Inventory – helps overcome supplier and process variation
- Over Production – ensures production variation and customer demand variation does not result in lost business
- Defects – caused by variation
- Waiting & delays – caused by variation in process performance

Therefore reducing and controlling Variation is the pre-requisite to the elimination of Muda

2. Enabling Act in PDCA

- Undeniably Lean's dynamic system is pegged in the iterative Plan-Do-Check-Act cycle
- While the Plan-Do gets the system closer to zero muda, the rapid cycle of Check (through the daily and monthly reviews) identifies issues requirement adjustment
- The Act requires scientific problem solving – hypothesis generation, data to valid (qualitative or quantitative), acceptance or rejection of hypothesis before solutioning

Lean is about finding solutions to achieve Single Piece Flow, not implementing Lean tools

Even Toyota does not have perfect Single Piece Flow!

3. Are They the Right Solution?

- There is no doubt that Lean tools and concepts work at Toyota – they are designed for Toyota’s problems
- They are intuitive and logical – how can visual management, 5S, Kanban, Andon, TPM, Heijunka, SMED, etc. not work?
- Even so, solutions need to address real quality and efficiency problems to be effective. Otherwise:
 - Add complexity to process without any real benefit
 - Adoption and sustainability will be a challenge
- The need to validate these ‘solutions’ before implementing requires skill to define the problem, identify root cause and assess appropriateness of solution

4. Lean – Really A LeaRn System

- Implementing Lean is about gaining ‘profound knowledge’ of the process
- Enabled in Toyota by the 3P3G culture construct and leader behavior:
 - Passion, People, Patience
 - Go-&-See, Get-The-Facts, Grasp-The-Situation
- This deep insight allows the development of robust solutions to tackle quality problems.

So Lean is not about implementing solutions, but learning about problems and solving them to get more efficient and effective

First Six Sigma, Then Lean

- The ultimate goal of Single Piece Flow is an excellent focal point for process improvement initiatives
 - the business orientation gets executives excited
 - the philosophy, concepts and tools are easy to understand and apply universally
 - the goal of zero muda is virtuous for the business, employees and customers alike
- Lean Thinking allows the business to monetize the Quality improvement and reduced variation achieved by Six Sigma
- Therefore the Quality improvement practitioners guide and toolkit will work much more comprehensive as

Six Sigma-ed Lean

Questions & Discussion