

## Three Perspectives on Lean

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In 1990 Jones, Womack and colleagues had published 'The Machine That Changed the World' as a description of the Toyota Production Systems, and coined the term Lean. The book itself was an offshoot of their research project, funded by the Western automobile manufacturers, to define World Class in automotive manufacture. The answer, Toyota's system, did not surprise anyone in the industry, and what the research failed to adequately address was not what Lean was, but how to implement it.

There are at least three different perspectives on Lean. The first was Shigeo Shingo's industrial engineering perspective.

There are currently ongoing debates about Shingo's influence on the Toyota system.

The facts are that he taught Industrial Engineering courses at Toyota for over 25 years from 1955 onwards. He taught the people who implemented Lean the engineering principles behind it. He saw Lean in terms of Non-Stock Production – producing with minimal inventory.

There is a grain of truth in Dan Jones' comment above, in that Toyota have never been too interested in theory, only practice. Shingo was a theorist as well as an engineer, and his theory was articulated as far back as 1946.

The theory was that manufacturing is a network of process (product flow) and operations and that non-stock production meant focusing on flow not individual operational efficiency. He derived this from Henry Ford's dictum that the longer anything is in the factory, the more it costs, at exactly the time when Sloan and GM were doing the direct opposite. How much Toyota were influenced by this theory, or how far Shingo's theory is just an explanation of Toyota's developing practice is being debated, but there is a match between theory and practice. The overarching theory behind this is the theory of demand amplification, a result of Systems Dynamics research.

The second perspective is Professor Fujimoto's Evolutionary Learning perspective, which is detailed in his book 'The Evolution of

a Manufacturing System at Toyota. I find the evolutionary perspective particularly valuable in explaining why the Toyota Production System works. Professor Fujimoto identifies three characteristics of the Toyota learning system – reliable standard methods, reliable standard problem solving techniques and experimentation.

Again, I doubt Toyota would describe themselves in this way, although I am sure they would applaud the emphasis on standard methods. As well as explaining how Lean developed at Toyota, Professor Fujimoto gives valuable insights into how companies can develop their own implementation strategy.

A third perspective is that of H Thomas Johnson, who studied Toyota USA for his book 'Profit Beyond Measure'. Johnson's theory is that Toyota 'manage by means' rather than 'manage by results'. What this means is that they focus on the process and the results follow, because they understand the process and are not diverted from the task by the natural variation which is common to all natural systems.

An example of a multiple perspective approach would be to consider Jidoka, autonomation. In most descriptions this is one of two pillars of the Toyota Production System, but it is interpreted in very different ways.

Jidoka is essentially a process to decouple people from machines. It was the foundation of Toyota's original weaving loom business as Mr Toyoda patented a device to stop a loom as soon as a thread broke.

This meant that workers did not have to closely watch looms, prepared to react to a break in the thread. The word came to be applied to any system that allows a machine to take action in response to problems, rather than rely on the observation of an operator.

From an engineering perspective, it is a form of automation designed to eliminate waste – the waste of an operator watching a machine, rather than performing valueadding work. From a process management perspective it is a form of Poka-Yoke – enabling the process to inspect itself and using this in-process inspection to

stop defects being passed on to other operations or the customer – it is a form of process control. From a learning perspective it is a way of releasing people from the drudgery of watching machines, enabling them to engage in value-adding activity. This last perspective has seen it interpreted as ‘Respect for People’.

How you interpret Jidoka effects how you try to implement Lean. Do you see it as a way of removing waste from the process, a way of controlling processes or a way of developing people? In reality it is all three, and we need to acknowledge all three in our attempts to emulate the success of Toyota, which is ultimately the goal of businesses implementing lean. A narrow waste elimination perspective misses a lot.

Many companies have struggled to implement lean approaches. One reason may be that they have too narrow an understanding of lean, and have attempted to copy the superficial elements of the process, rather than understanding the place of these elements in a lean system. A multi-perspective approach can help avoid this and should be part of the learning process for all our lean leaders.