



On Lean Enterprise and Its Potential Healthcare Applications

Lean Enterprise's roots lie with Deming. Shortly after World War II, Toyota embraced Deming's "western" approach to quality improvement and infused it with an "eastern" approach to business and people management. The blended model, the Toyota Production System, was re-imported to the United States in the mid-1990s as a result of Jim Womack's work at the Massachusetts Institute of Technology. Womack studied Toyota's highly successful approach to process and business management and dubbed the model Lean Enterprise. The seminal work describing the philosophy in full is *Lean Thinking* (Jones & Womack, 2003).

Lean has been widely used to transform manufacturing processes in the automotive, aerospace, and consumer goods industries. When manufacturers successfully began applying these principles and tools to office processes, it became clear that the Lean approach would be equally effective in the service sector. Service sector leaders, such as Bank of America, Sprint, Wal-Mart, and Southwest Airlines, are transforming their operations with Lean principles and tools. The Lean approach is relatively new to healthcare, but it is likely to become the methodology that ultimately resolves many of healthcare's most pressing challenges. The University of Pittsburgh Medical Center is one healthcare organization that has achieved impressive results through the implementation of Lean Enterprise principles and tools.

Eliminate waste, create flow, add value. These are the objectives of establishing a Lean Enterprise. Results are typically rapid and dramatic, including

shortened cycle and throughput times, fewer errors, lowered inventory, reduced floor space, and an empowered workforce due to their involvement in the process. Metrics for percentage improvement are generally in the 50%–70% range following an initial effort.

How are these results achieved consistently? Traditional total quality management (TQM) and continuous quality improvement (CQI) approaches have focused on an operation's value-added activities. But typically these activities account for only 10%–20% of the cost and lead time associated with a process. The Lean Enterprise shifts the emphasis to the costs and activities between the value-added process steps. The approach focuses on the creation of flow through the identification and elimination of eight primary types of operational waste:

- unnecessary processing
- errors/defects
- waiting
- overproduction
- inventory
- excess motion by people
- transportation of product
- underutilized people.

When flow is achieved, cycle times and lead times are reduced greatly, freeing resources to perform important tasks often ignored when workers are focused on correcting mistakes, expediting orders, resolving customer complaints, inspecting the work of others, obtaining multiple approvals, and so forth. These are all symptoms and products of waste. Interestingly, as process time is reduced, quality goes up and cost goes down. Lean Enterprise transforms

organizations into agile vehicles for responding to marketplace realities, such as reduced revenues, fluctuating customer demand, and rising technology cost.

The Approach

The success of the Lean Enterprise approach to improving processes lies in its intensity and focus. In addition, cross-functional teams of workers design and implement the improvements, creating a highly sustainable program due to involvement and commitment of the workers affected by the change.

The sequential activities involved in Lean implementation are as follows:

- train workers about Lean Enterprise principles and tools
- define product/service families
- define value from the customer's point of view
- create Value Stream Maps for selected product families
- prioritize areas for improvement
- create an implementation plan
- implement rapidly via focused Kaizen Events
- measure results
- adjust, if necessary.

With leadership commitment and an empowered workforce, dramatic and quantifiable results are achieved rapidly. It's possible, for example, to complete the aforementioned steps in as few as 30 days. With this model, improvements are implemented in days and weeks, not months or years.

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Lean Tools

Why is lean so effective? Lean utilizes an effective set of practical tools to minimize waste and maximize flow, such as the following:

- Value Stream Mapping (to “see” performance-sapping waste)
- Metric-Based Cross-Functional Process Mapping
- Poka-Yoke (error proofing)
- Flow-Based Layout
- Pull Systems (FIFO Lanes, Kanban)
- Batch Size Reduction
- Standard Work
- Visual Workplace/5S
- Work Balancing
- Flow-Based Metrics
- Setup Reduction
- Total Productive Maintenance.

Tools are selected based on the process being reviewed and the specific objective of the improvement process. Cycle and lead time reductions free human resources in significant numbers to do more creative work and speed the delivery of services and products to customers. In addition, workers in Lean organizations serve as fire marshals rather than firefighters, restoring the energy drained from a well-intentioned workforce focused on reacting to daily crises.

Lean Enterprise generates faster and more dramatic results than traditional TQM and CQI efforts because of the eastern approach in which the Japanese believe so strongly, such as rapid implementation, pulling from the customer (i.e., making a service or product available to an internal or external customer

only when the customer is actually ready to use the product or service), and “bottom-up” improvement efforts (i.e., improvements designed and implemented by the workers themselves). A few of the results-generating concepts are counterintuitive to western thinking. For example, batching paperwork or tasks is considered a “push” method of work; that is, as soon as one person or department has completed their part of a process, the “product” is “pushed” onto the next step, regardless of whether that person or department is ready to work on it, creating delays. Because of this, batching is generally less efficient than “one-piece-flow,” which keeps the “product” in motion at all times and vastly reduces cycle times and throughput times. Lean simulations effectively demonstrate this principle to skeptics.

The Bottom Line

The ultimate goal of any improvement effort is to design, produce, and deliver services and products faster, better, cheaper, and easier. Today’s healthcare marketplace demands this more than ever. Lean Enterprise comprises both a proven philosophical approach to operations design and management and the tactical tools to support this business model. The Lean Enterprise approach is the reason why thousands of organizations across the globe are achieving unprecedented results in many aspects of their performance.

Many healthcare organizations are turning to Six Sigma to improve their

processes. Although Six Sigma is an excellent approach to reducing process variation, it is often applied too early in the improvement cycle. Even after years and years of TQM and CQI efforts, most organizations are still riddled with operational waste, which must be eliminated prior to the fine-tuning for which Six Sigma is best suited. The ideal approach is to either implement Lean followed by Six Sigma or blend them from the beginning using a “Lean Sigma” model. Organizational performance will be most dramatically affected by the elimination of waste and then will continue to improve as processes are further refined and variation is further reduced.

Lean Enterprise is not a flavor-of-the-month quality initiative or management model. It has withstood the test of time and continues to transform ordinary businesses into world-class organizations in every industry. If hospitals, health plans, and physician practices opt for Lean practices, each will benefit tremendously. But the greatest beneficiary of the Lean Enterprise approach to operations management is the group they serve—patients, the ultimate customers.

Reference

Jones, D., & Womack, J. (2003). *Lean thinking: Banish waste and create wealth in your corporation, revised and updated*. New York: Free Press.

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