Answers to In-Text Questions

# Chapter 14: Lean Operations and Supply Chains

## Discussion Questions:

1. Explain the 3 types of Waste, (muri, mura, muda) in your own words. Can you think of situations where you have seen each of these types of waste in jobs you have performed?

Answer: Muri is waste due to unreasonable work because of poor systems design. Examples are heavy weights, dangerous tasks, or inefficient system. Mura refers to out of balance or uneven workloads. Examples are uneven workloads, bottlenecks, poor scheduling, mismatch capacity, etc. Muda is wasteful activity that does not add value, or is unproductive. Examples are any activities that consume more resources than necessary to deliver a proper product. Any actual examples within these guidelines are acceptable.

1. Compare the ideas of Lean with the 5S framework. How do they complement each other, and how are they distinctly different?

Answer: The 5 S framework is a compliment to Lean principles. The 5 S’s refer to the organization and cleanliness of work areas, which are enablers of the lean principles by creating workspaces that are conducive to better organization and ease of spotting wasteful areas to improve. The Lean principles assist in the creation of smoother workflows, and less non-value tasks, more efficient inventory, and better cooperation, trust and respect between managers and workers.

1. What are the differences between Push and Pull systems? Which seems more difficult to manage?

Answer: Push systems are systems that make or order inventory based on a forecast of demand. They depend on good execution of the planning function, and production execution. These can be wasteful because a company may be executing on a forecast, when the customer demand has shifted.

A Pull system produces the product only after it is ordered, as in a make-to-order product, or an inventory replenishment after the products are actually sold. Services are innately made to order, (a Pull system), since they generally cannot be inventoried, and are produced when the customer is ordering them. A pull system is a better example of Lean execution.

Pull systems are generally more challenging to manage, since the production is stopped or started on different products more often, and requires a more dynamic flexible use of resources, especially people assets.

1. Why is production in small lot sizes essential to achieving Lean Operations?

Answer: Smaller lot sizes make it easier to manage with lower work in process inventories, be more agile and flexible to shift from producing one product to another, as customer demand shifts.

1. Why is value Stream Mapping such a critical first step in a company’s move toward a Lean approach to operations?

Answer: Value Stream mapping is a logical first step in understanding the sequence and timing of production steps to enable managers to pinpoint wasteful opportunities for reduction by creating a visual map that can enable brainstorming to improve efficiencies.

1. What types of production processes are most conducive to developing a Value Stream Map?

Answer: You should choose processes that would appear to be the most wasteful, inefficient or have the most transportation or movement in their function, etc.

1. Lean Production requires seven steps to be taken. Why in your opinion, should the first step be designing the process flow?
2. Why is uniform production an element of lean, and how is it achieved?

Answer: Processes are linked together, and the lean objective is a smooth and balanced flow. This is the idea of dependence, and the overall speed of the system should be uniform. You should keep in mind workflow and throughput. A pull system using Takt time will help, as would reducing bottlenecks, stable level schedules, frozen time fences, etc.

1. How are Lean thinking and Six Sigma related?

Answer: They are complementary concepts, and both relate to adding value to the end customer. They are often used together. Many leading companies use them, as in Lean Six Sigma. Operational improvements, and Quality improvements go hand-in-hand to add value, and are often co-dependent and require the same types of innovation and improvements.

1. What are the advantages of Lean services?

Answer: The more that Services can be analyzed and standardized, the better the experience is for the customer, because a lean service is uniform, efficient, (usually translates as faster and the better the quality), and predictable. It has been proven that lean operations are more profitable, and satisfy the customer better. Continuous improvement is highly important in service delivery.

1. Which lean approaches work in both manufacturing and service operations?

Answer: Almost all of the Lean operations work effectively in both environments except Just in Time inventory works mainly in manufacturing, as does smooth scheduling.

Aspects of continuous improvement, smooth work flow, process design, value stream analysis, pursuit of perfection, moving towards a pull system, (which is usually inherent in providing services), reduction of bottlenecks, work mostly the same in both approaches.

1. What are the elements in a lean supply chain? Why are transparent information and full collaboration two critical components of lean supply chains?

Answer: A lean supply chain relies on the leaning of its major flows: products, services, information and financial flows. Competitive advantage stems from the synergy and unity of purpose the partners, based on trust and collaboration. Each member needs to remain profitable and ensure customer satisfaction. As much information as possible should be transparent and shared freely among members to prevent surprises. The timely sharing of information is greatly facilitated by current IT systems. Full and aggressive collaboration between companies is essential. A high degree of interdependence is required over time, creating stability and mutually beneficial relationships.

1. Discuss briefly the key elements of Lean Logistics.

Answer: Lean logistics approaches include Just in Time delivery of materials or inventory to facilitate the smooth flow of production; Cross Docking, so that goods coming into a distribution facility can be sorted, and immediately shipped, without storage; Vendor Managed inventory, (VMI), to more efficiently control inventory by expert partners; Use of 3PL firms, which are usually more efficient and reduce a companies’ need for transportation, import and export personnel; and location of suppliers near producers in a concentrated Supplier Park, for more efficient movement of materials.

1. You are the shift manager of a medium sized restaurant. Identify three changes you could make, to begin taking a lean approach at the restaurant.

Answer: Changes could range from just in time inventories of ingredients from your supplier, to looking for areas to cut waste, to the 5S methods to be more organized and use space wisely, to

Make larger batches of the special to reduce wait times, to better supplier relationships, to reduction of poor quality and rework, to mistake proofing the system, to improving the kitchen layout, etc.

1. Suggest ways that lean principles can be applied to a hospital.

Answer: Answers could range from Review supplies, instruments, facilities, procedures to reduce waiting times, prevent errors, make production operations smoother, and more standardized as much as possible; Reduce backtracking for missing supplies or equipment; Use of color codes, checklists, and other mistake proofing methods; reduce waiting times that are non-value added activities, etc.

# Critical Thinking Exercises

1. Go to Oracle’s (Oracle Corporation, Redwood City, CA) website (https://www.oracle.com/index.html), and read about its software applications for retailers. Thousands of retail and wholesale distribution companies around the world rely on Oracle for maximum flexibility and profitability. How does the software use sales and inventory data to help retailers accomplish lean supply chain operations?

Answer: The software can help organizations understand their inventory to sell direct to customers, creating efficiency for both the customer and the retailer.

1. Go to GE’s website (http://www.ge.com/). How is GE’s corporate slogan, “Imagination at Work” consistent with its commitment to Six Sigma? What are the key concepts of Six Sigma as defined by GE?

Answer: GE uses data to inform their processes to find effective solutions. Table from <http://www.ge.com/sixsigma/sixsigstrategy.html>:

|  |  |
| --- | --- |
| **Critical to Quality:** | Attributes most important to the customer |
| **Defect:** | Failing to deliver what the customer wants |
| **Process Capability:** | What your process can deliver |
| **Variation:** | What the customer sees and feels |
| **Stable Operations:** | Ensuring consistent, predictable processes to improve what the customer sees and feels |
| **Design for Six Sigma:** | Designing to meet customer needs and process capability |

1. Imagine you work for a company that provides lean operations and logistical solutions for business around the globe. Watch the video, “[Kanban Logistics—A Top 3PL Company](https://www.youtube.com/watch?v=4Ded_y5WpxU).” What operations management–related job opportunities does the company offer?

Answer: Kanban Logistics offers numerous operations management-related opportunities, related to logistics, warehousing, distribution, fulfilment, and more.