

Lean Thinking: Examples and Applications in the Wood Products Industry

Henry Quesada, Assistant Professor, Wood Science and Forest Products, Virginia Tech
Urs Buehlmann, Associate Professor, Wood Science and Forest Products, Virginia Tech

Lean Thinking and Traditional Manufacturing

Lean thinking is a process focused on increasing the value added to products and services and the reduction of waste. The term “lean,” coined by Womack during one of his visits to the Japanese carmaker Toyota in the early 1980s (Womack and Jones 2003), has become the universally accepted term for increasing value and reducing waste.

When talking about value, we refer to everything undertaken with a product or a service for which customers are willing to pay extra. Waste, conversely, refers to all activities that do not add value from the customer’s point of view, i.e., everything for which customers are not willing to pay extra.

Examples of added value for manufacturers include extra product features deemed valuable by customers, shorter lead times, and more convenient deliveries in smaller batches. On the other hand, activities such as keeping excessive inventories, unnecessary transportation, waiting time, and reprocessing are considered waste (Womack, Jones, and Roos 1991). For a service organization, common sources of wastes are long customer waiting times, reprocessing of applications, incorrect automatic charges, and excessive paperwork. In general, there are seven types of waste present in processes (Womack and Jones 1991).

1. **Overproduction** – When more articles are produced than are required in a production order. This causes an increase in finished inventory and holding costs.
2. **Waiting** – Idle equipment or operators waiting for raw materials, tools, or a maintenance crew.

3. **Unnecessary transportation** – Avoidable transportation of goods, parts, or information is waste. Also, mechanical damage can be inflicted to parts or goods while being transported.
4. **Overprocessing or incorrect processing** – If project orders or processes are not clearly defined, tasks will be performed in the wrong way, producing the wrong outputs. This will add more cost to the product or service, and customers will not receive what they are paying for.
5. **Excess inventories** – Excess raw material, work in process (WIP), and finished goods inventories produce long waiting times, obsolescence, damaged products, unnecessary transportation, and holding and production costs. Also, excess inventory is related to uneven demand, supplier problems, defects, long setup times, and maintenance problems.
6. **Unnecessary movement** – Any unnecessary movement by employees, such as searching for parts or tools or excessive walking distances are wasteful.
7. **Defective products** – Manufacturing products that do not meet customer specifications is a waste, which creates unsatisfied customers and increases total manufacturing costs.

Recently, an eighth kind of waste is being included with the previous seven (Liker 2004):

8. **Unused employee creativity** – Not listening to employees and losing time, ideas, skills, potential improvements, and learning opportunities.

www.ext.vt.edu