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Lean manufacturing

Lean manufacturing - Time to think lean!

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Eco-efficiency for the Marine Industry Fact Sheet

Do you want to

- ☑ remove bottlenecks?
- ☑ improve productivity?
- ☑ improve quality?
- ☑ use resources more efficiently?

Lean manufacturing is a business and manufacturing management philosophy that aims to improve quality, productivity and supply chain management through the elimination of waste from processes and operations. In lean manufacturing, waste is defined as any consumption of a resource which does not add value to the customer. Waste can be caused by:[1,2]

- **overproduction**—making more than the markets want. This consumes available machine capacity, materials, labour and floor space, without contributing to the cash flow of the business.
- **inventory**—storing more than is needed at this time, tying up floor space and capital.
- **waiting**—for parts, machines or labour. Waiting leads to work queues that slow workflow, and complicated materials movement or production resources being starved of work.
- **transportation**—movement of materials. While some movement is necessary in any manufacturing operation, the act of transporting goods does not transform the product in any way that the customer is prepared to pay for, yet it consumes labour and often requires equipment. Minimising transport distances within and outside the factory leads to improved production efficiency and reduced costs.
- **motion**—movement of equipment and staff. This does not add value to the product, yet it consumes time and production capacity.
- **inappropriate processing**—that adds no value to the customer, yet consumes available production resources and adds to the cost of production.
- **defects and rework**—substandard products which are scrapped or reworked.

Lean thinking assesses all the aspects of the supply chain, from the receipt of the order to the point of shipping, to determine what is of value to the customer, what is waste, and where the largest efficiency gains can be made.[3]

Case study: Sea Otter gets lean and improves productivity[4]

Sea Otter Boats, in Chesterfield, UK, employs 25 staff to design and build small narrow aluminium boats for use as working vessels and pleasure craft.

After an assessment against lean manufacturing principles, recommendations were made to improve workflow, eliminate regular production bottlenecks and simplify the supply chain.

Labour and material cost control data and time sheets are now collated, enabling individual performance figures to be monitored. All aspects of production are now accurately costed, and improved by better management, from drawing through fabrication, first fit, joinery, painting and final fitting.

Review of the purchasing policy and rationalisation of suppliers has resulted in approximate cost savings of $AU21,500 p.a. Streamlining production also reduced the build time in the workshop by 8%, equivalent to savings of $AU36,000 p.a.

Targeting waste leads to a dramatic improvement in profitability and competitiveness. Lean manufacturing also improves environmental performance by satisfying demand using fewer resources, more effectively. While the reason most organisations will adopt lean manufacturing principles is for the economic returns they bring, elimination of each of the seven wastes has the added benefit of reducing environmental impacts.

Waste	Environmental benefits of eliminating the waste[5]
Overproduction	• Less material and energy consumed as unnecessary items are not produced • Less risk of obsolescence or spoilage of products • Less wear and tear on production equipment
Inventory	• Reduced storage requirements • Reduced handling leading to less stock damage • Reduced congestion in the factory resulting in less stock damage • Lower chance of spoilage, deterioration or obsolescence of stock
Waiting	• Reduced wasted energy, heating, cooling because resources are idle less of the time
Transportation	• Shorter and simpler material movement consumes less energy, requires less equipment and reduces the likelihood of handling damage • Less chance of product spills and associated clean-ups
Motion	• Less chance of product spills and associated clean-ups • Less energy consumption
Inappropriate processing	• Eliminating unnecessary processing, resulting in customer demand being satisfied with less materials and energy being consumed • Reduction of waste created by unnecessary items such as excessive packaging materials
Defects and rework	• Raw materials no longer consumed making defective products • Fewer defective components, leading to less rework and disposal • Reduced defects, eliminating contamination of finished products (e.g. fewer returns to the factory, better reputation)

With a systematic approach to eliminating waste, both the business and the environment can benefit. Businesses achieve better profits and greater competitiveness, while at the same time reducing the consumption of energy and materials, and producing fewer harmful emissions and wastes. This makes lean manufacturing a win-win for businesses wanting to improve their competitiveness without harming the environment.

Technology for lean manufacturing

The Queensland Department of State Development, Trade and Innovation has released a Technology Roadmap for Recreational Boat Builders that provides useful information on emerging technologies relevant to the industry. Contact the Marine Industries Sectoral Development Team at www.sdi.qld.gov.au for more information.

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For further information

Ecobiz can assist you to reduce costs and improve eco-efficency in your business Call 1300 369 388 for further information.

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