The 7 Great Wastes é

Waste[5)]	Creates	Where Does This Waste Exist in Our Organization?	Analyze – Ways to Eliminate
• Errors/defects	- turn backs, rework, recalls - inspection, testing - high cost of poor quality		- prepare failure modes and effects analysis (FMEAs) - implement mistake proofing (poka-yoke) techniques to reduce the potential risk of producing a defect - analyze parts rejected by customers
• Inventory	- excess carrying costs - excess materials, maintenance, repair and other (MRO) supplies		- synchronize work flow so that stocks do not accumulate during work in process - employ single minute exchange of die (SMED) techniques to shorten setup time and reduce batch sizes
• Processing Hardest to find ï it may appear that the processing is actually adding value!	- data reentry - no standards - excessive checking - setup material		- determine criteria and methods needed to ensure that both the operation and control of processes are effective - quality at the source, eliminate re-checking - question if process is needed at all - extend thinking to elimination of component if possible
• Delay/waiting	- idle operator (watching equipment run) - idle time in process - unscheduled maintenance - waiting on materials, tooling, information		- synchronize work flow - balance uneven loads with flexible workers and equipment - implement total productive maintenance (TPM) techniques to eliminate machine down time
• Motion	- poor work arrangement - misunderstanding - no ergonomic analysis/planning - non value adding activities		- training ï ensure employee competency - study motion for ergonomics, economy and consistency - minimize reach, lifting and walking - mechanize where possible to avoid waste

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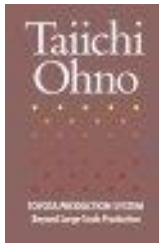
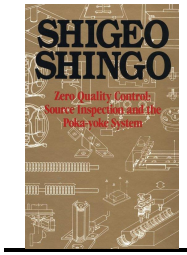
• Transportation	- needless transport and handling - inefficient floor-plan layouts - nonconforming material transport		- define layout and locations to remove transport as much as possible - continue to look for ways to eliminate material movement
• Overproduction The worst ï it multiplies the effects of the previous 6!	- producing more than the customer requires		- employ single minute exchange of die (SMED) techniques to shorten setup time and reduce batch sizes - produce only what is needed now - create visibility and compact layouts

Effectiveness ï waste is never planned ï relentlessly identify waste through internal audit of the processes, from the time the customer places an order to the time the payment is received, and eliminate it, using preventive and corrective action procedures.
Waste Management (No Waste) = 0 changeover time; 0 downtime; 0 nonconformances; 0 inventories; 0 idle time; 0 inspection



5) Taiichi Ohno identified the seven common areas of waste noted in the table above.
Taiichi Ohno, *The Toyoto Production System* (Stamford, CT: Productivity Press, 1988)



ñQuality problems are still largely believed to be the fault of the operator. Worse, the solution is commonly thought to be the increased use of statistical methods or manual inspection. In fact, virtually all quality problems can be eliminated by improving design specifications and by the use of [data processing systems,] equipment and tooling that are designed to either be incapable of defective production or, alternatively, designed to automatically reject any defective unit produced.ò
Shigeo Shingo, *Zero Quality Control: Source Inspection and the Poka-Yoke System* (Stamford, CT: Productivity Press, 1986).