Lean Manufacturing Techniques

Description	
What it is	Lean Manufacturing is a systematic method for waste minimization ("Muda") within a manufacturing system without sacrificing productivity. Lean also takes into account waste created through overburden ("Muri") and waste created through unevenness in workload ("Mura"). Working from the perspective of the client who consumes a product or service, "value" is any action or process that a customer would be willing to pay for.
Case Study	See Attachment for examples of all following tools
Objective	
Outcomes Expected	To improve the Quality/Cost/Responsiveness outcomes of a business with the customer at the centre
Why Used	Every business can benefit from analysis and improvement of its processes. This is a journey of continual improvement employing a structured, well proven, approach
Scope	
Where Used	This tool can be used in any business that has complex processes to meet its customer requirements
How Used	As a methodology it is best introduced as a "pilot" project to demonstrate and showcase the benefits to a generally sceptical wider business audience.
Deployment	
Tool Training	The most successful approach for deploying lean within a business is to identify a "pilot" project within the business that is struggling with Q/C/D issues. Appoint a small cross-functional team to lead the improvement pilot, train the basic techniques of lean in a classroom environment,
Generic Tasks	1. Identify Pilot Project
	2. Select Cross-functional Team
	3. Set project contract with team & team leader
	4. Team leader train team and engage with pilot simultaneously
	Complete pilot, publish results, share outcome with wider business

Lean Manufacturing - Value Stream Mapping

Description	
What it is	Understanding process and information flow is key to understanding how to make business improvements. This flow - called the "Value Stream", can be mapped and is a lean-management method for analysing a current business state and used to design a future, improved state for the series of steps that take a product or service from origination to the end user. At Toyota, it is known as "material and information flow mapping".
Case Study	
Objective	
Outcomes Expected	Detailed process steps of the entire business process being examined – this will include Inputs/Outputs/Methods
Why Used	To understand the detailed workings of the business process in order to apply appropriate business improvement techniques, reducing or eliminating non-value added steps and improving process capability
Scope	
Where Used	In any business process that needs to be improved
How Used	Improvement team, suitably trained and resourced, following the process flow, capturing information – process s steps/inputs/outputs/real data
Deployment	
Tool Training	Formal classroom training & practical projects
Generic Tasks	1. Define and pick the product or service to be evaluated
	2. Create the Current State Value Stream Map (CSVSM)
	3. Develop the Future State Value Stream Map (FSVSM)
	Develop an Action Plan to achieve the FSVSM

Lean Manufacturing - Problem Identification & Resolution

Description	
What it is	Structured approach to problem solving - data driven, relevant team involvement. Stages: 1. DETECTION of the Problem 2. PROTECT the Customer 3. DEFINITION of the Problem 4. ANALYSIS of the Root Cause 5. IMPLEMENTATION of Countermeasure
Case Study	
Objective	
Outcomes Expected	Structured approach to problem solving – clear understanding of root causes/data driven and solution identified
Why Used	To provide a clear brief for process improvement, to respond to a detected problem where the root cause is unknown and process for improvement is not agreed or clear
Scope	
Where Used	Where no obvious or agreed root cause exists to a problem but the symptoms of the problem are evident e.g. Quality, Cost or Responsiveness issues exist.
How Used	Improvement team, suitably trained and resourced, following the process flow, capturing information – process steps/inputs/outputs/real data
Deployment	
Tool Training	Formal classroom training & practical projects
Generic Tasks	
	1. Define - Define the Problem
	2. Measure - Map out the current process
	 Analyse - Identify the root cause of the problem Improve Implement & verify the solution
	4. Improve - Implement & verify the solution
	5. Control – Maintain the solution

Lean Manufacturing - Lean Foundations - 5S/SOP/VM

Description	
What it is	These are the foundations of the Toyota Production System – organised environment, standardised processes and utilisation of visual management techniques.
Case Study	
Objective	
Outcomes Expected	To produce an organised, efficient work environment, using standardised processes that everyone follows and require little or no interpretation.
Why Used	To make visible and then eliminate or minimise non-value added activities
Scope	
Where Used	Throughout the entire value stream where people are engaged in value adding activities.
How Used	Map the business value stream, identify logical groups of activities or "cells" of work and apply the principles to each of these "cells" – these could be product or information process flows
Deployment	
Tool Training	Formal classroom training & practical projects
Generic Tasks	
	1. Identity the process to be improved
	 Use 55 techniques to create an organised environment Use Visual management to make the process clear, simple and value adding
	Ose visual management to make the process clear, simple and value adding A Document the process to ensure conformity
	in Boounent the process to ensure conformity

Lean Manufacturing - Pull Systems

Description	
What it is	The principle of a pull system is based on developing all business activities with the customer at the centre. The customer determines the demand for each product or service and the business processes need to be aligned to support that. There are many techniques that can be adopted to facilitate this - Kanban, Flow balancing, TAKT, Visual scheduling
Case Study	
Objective	
Outcomes Expected	A business activity that is closely aligned to meeting customer requirements
Why Used	Improves all the business key metrics of quality, responsiveness, cost
Scope	
Where Used	In any business that is not meeting or exceeding customer expectations at the lowest possible cost
How Used	As a methodology is it is best introduced as a "pilot" project to demonstrate and showcase the benefits to a generally sceptical wider business audience.
Deployment	
Tool Training	Formal classroom training & practical projects
Generic Tasks	Value Stream Mapping Balancing flows Produce to customer demand Control processes Measure

Lean Manufacturing – Case Study Examples

Value Stream Mapping – Current State Map & Future State Map

Problem Identification & Resolution

Pilot Projects

Lean Foundations – VM/5S/SOP

Pull Systems



Value Stream Mapping – Current State Map & Future State Map



Problem Definition and Planned Resolution



Pilot Projects undertaken in a food processing facility

Case Study Examples of completed Pilot Projects

Typical tasks undertaken

- Process Quality Improvement 5% increase in OEE benefit £20k/pa
- Reusable boxes for waste and recycling and CHEP pallet management £13k/pa
- Indirect materials kanban pallets & boxes excessive movement reduction/damage reduction/stock reduction £14k/pa
- Office workplace organisation £productivity
- Visual management/controls data sheets fquality/fproductivity



Pull Systems & Visual Techniques

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	TARGETTED					
BEFORE	IMPROVEMENT	AFTER	ΤΟΤΑ	L WASTE	COST	SAVED
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?					£proc	ductivity
			£	75,000	£	15,00
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Visual Process Mapping, Problem Solving

Examples from a project solution in a food processing facility

BUSINESS IMPROVEMENT CASE STUDIES							
PRODUCT REWORKED/SCRAPPED DUE TO POOR TEMP CONTROLS	•						
PROBLEM DESCRIPTION							
Food Processing Factory							
Cost of material waste due to inconsistent processes							
3-5% material losses equivalent to ~1000kg per week							
Approximate cost to the business £300k pa							
Key loss areas							
- Product breaking at stamper - too hard							
- Product not retaining shape - too soft							
- Finished product not retaining shape - leakers							
METRICS							
		TARGETTED					
	BEFORE	IMPROVEMENT	AFTER	TOTAL WASTE		COST SAVED	
Product Temperature variation	+3-2deg c	+1-1deg c					
Product Loss (kg/week) @ £2.50/kg (cost)	1000	50%	500	£	130,000	£	65,000
				£	130,000	£	65,000
SOLUTIONS IDENTIFIED							
Establish set area for temp check prior to releasing product from	mix area						
Set procedure for bringing product form chill to line							
Train operators to carry outtemp checks ands critical path of prod	luct from mix	to line					
KEY CHANGES							
Training matrix established - critical tasks v key operators							
manning matrix established - critical tasks vikey operators							
Temp control station introduced							

Product Scrapped/Reworked due to Poor Temperature Controls





Example of Project Work - Team Improvement Sheets – Before & After