

TITLE: LEAN MANUFACTURING TRAINING AND CONSULTING USING COSTS TO DRIVE AND MEASURE CONTINUOUS IMPROVEMENT PROJECTS.

PROPOSITION:

LEAN Manufacturing Training and Consulting Programs which use COST indices to plan and track Continuous Improvement LEAN Projects is the most effective. Here's the whys and hows.

Abstract:

"Using measurements to drive and sustain quality performance improves the probability of achieving the organization's strategic objectives"

- Yale School of Management

Manufacturers worldwide today face tremendous pressures brought about by increasing competition. The steady erosion of selling prices and shrinking profit margins force manufacturers to continuously seek to cut costs and wastes so as to achieve lower and still lower manufacturing costs.

Saving on labor costs is one of the most obvious ways to reduce overall Product costs. And so is out-sourcing. But as these practices become the standard operational mode, the ground is leveled again and manufacturers turn to the other two battlegrounds for determining the survival of the fittest - Creativity and LEAN.

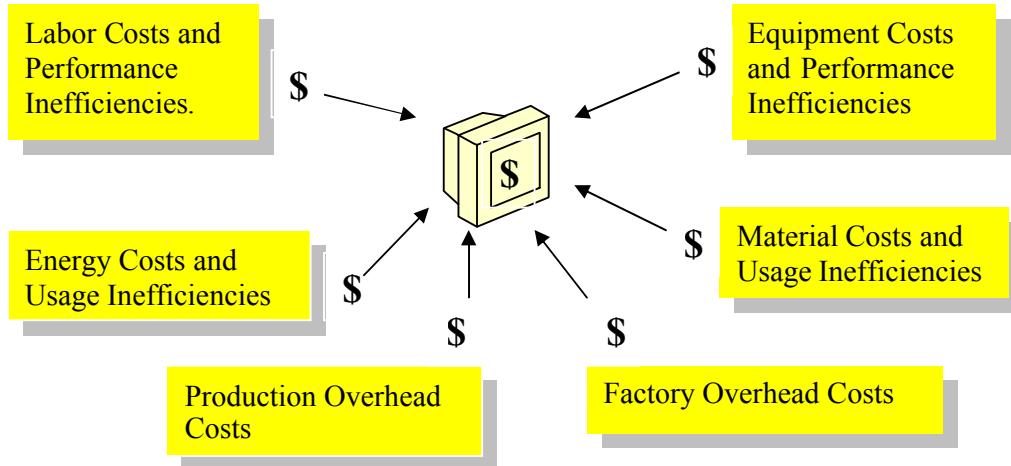
LEAN Manufacturing has been defined as the sum total of JIT (Just-In-Time), Kanban (Pull system), Kai'zen (Continuous Improvement), Zero Defects, Zero Breakdowns, Zero accidents and Zero inventories

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1. Cost Elements In Manufacturing.

The cost structure of each WIP in each Process and cost of the Final Product y can be represented as follows:



Each of these ‘Six Cost Elements’ have both Technical / Operational Measurements as well as their equivalent Cost Measurements. For example, it is possible to calculate the Cost of the Technical / Operational indices and produce the following relationships in the TABLE for both the Final Product as well as a WIP at any process. As each Product is manufactured over multiple processes, any WIP losses incurred in a mid-process also incurs the value-added losses accumulated over the completed processes.

Cost Of Each WIP (Example Only)	Each \$6.74	Remarks On The Equivalent Technical or Operational Indices.
Preceding Stage Cost	\$5.07	Valued added costs of previous process stages.
Direct Labor Costs	\$0.20	Operators, Inspectors, Technicians, Supervisors
Direct Production Expenses	\$0.13	Electricity, Gas energy used in the Process and machines.
Production Material Losses	\$0.04	Damaged, expired, wasted, spilled, remnants.
Production Material Costs	\$0.30	Actual cost of material used per piece of WIP.
Machine Performance Losses	\$0.14	Slowed speed, frequent breakdowns and setup times and jams in automated systems resulting in less output produced.
Process Yield Losses	\$0.18	Scrapped due to failed quality standards.
Production Overhead Costs	\$0.35	Depreciation, Repairs & Maintenance, indirect staff, floor space rental, property taxes, indirect production materials, etc...
Factory Overhead Costs	\$0.33	Overhead costs incurred by the support, administrative and management staffs.

2. Challenges Of Planning LEAN Manufacturing.

In a typical scenario, the Managing Director of Manufacturer XZ announced to his staff that their Total Product Cost has to go down 8% per year for the next 3 years in order to maintain their Profit Margin in view of the project erosion of Selling Price. He asked for all his Departmental Heads to submit plans so that the Company can achieve this 8% cost-reduction goal.

The MD's request was met with a muted response as none of his Department Heads are able to be very specific about cost-reduction initiatives except for perhaps, reduction in headcounts, budgets cuts on Repair and Maintenance where the costs are already measurement in dollars.

On the other hand, many important technical / operational cost-reduction initiatives such as those listed below have no easy convertibility to COST.

- Reducing the scrap by improving the Process Yield %,
- Increasing the machine uptime by reducing breakdowns, setups, jams, etc...
- Reducing the material wastages in the Production processes.
- Improving efficiency of energy consumption in certain processes
- Improving the process flow and reducing the cycle time.

As a result, LEAN Projects planning are seldom specific enough in terms of meeting budget goals. They often continued to be expressed only in their relevant technical / operational measures. Their eventual impact on the cost-reduction goal is also seldom verifiable.

Especially in mature industries, competition tends to be extremely keen and over the years, the obvious or so-called, low-hanging fruits are all but exhausted. Manufacturers run out of ideas for improvements to achieve further cost reductions. The use of the LEAN ScoreBoard will enable manufacturers to ferret out the higher-hanging fruits that are usually not obvious otherwise.

3. How The LEAN ScoreBoard Measures LEAN.

The LEAN ScoreBoard is a software solution for Lean Manufacturing Planning. Existing Enterprise Resource Planning (ERP) and Manufacturing Resource Planning (MRP) solutions provide manufacturers with effective and efficient integration of Finance and other business processes with Production Scheduling and Inventory Control. The LEAN ScoreBoard is a CiP (Continuous Improvement Planning) Software which provide Manufacturers with enhanced ability to plan effective cost-reduction improvement projects to achieve LEAN manufacturing

The LEAN ScoreBoard can be used by ANY manufacturer for enterprise-level Continuous Improvement project planning for Product Cost-reduction.

It breakdowns the Total Product cost into equivalent process-level cost details in relation to technical + operational data such as – a) Machine performance b) Material usage c) Overheads d) Energy consumption e) Labor inefficiencies.

The LEAN ScoreBoard takes input information that is commonly available from the Accounting and Operation Departments. Though some customization of INPUTs is required across different industry-types and the Process Engine Software is generic.

It is web-based to provide everyone in the enterprise (Top Management, Managers, Executives and Engineers) access to accurate product cost information that is related to detailed Process-level technical and operational information. This promotes organizational alignment to achieve the LEAN organization.

The LEAN ScoreBoard works in 3 steps. In Step 1, a standard set of commonly available Selling Price, Profit Margin %, Accounting and Operational data is keyed into a user-friendly customized Input-interface screen.

In Step-2, the LEAN ScoreBoard process engine digests the input data to produce informative reports at enterprise and individual process levels. These reports relate cost / technical / operational indices together at each process. This provide Managers, executives and engineers with critical information for detailed and meaningful planning which includes

- a) Selection of significant improvement-projects to achieve the cost-reduction goal.
- b) Identifying Key Improvement Concepts for each selected project.
- c) Quantifying the amount of improvement target (technical or operational indices) for each selected project and the expected cost-reduction potential.

The cost-reduction impact on process cost and overall product cost can be simulated by inputting these improvement targets into the LEAN ScoreBoard.

The LEAN ScoreBoard operates in real-time. As each month's data from Accounting, Operations and Project Team are entered, the LEAN ScoreBoard publishes updated current-month status of costs / operational / technical / project team's status in an integrated and related manner.

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The LEAN ScoreBoard Solution

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