

WHAT IS LEAN ACCOUNTING?

Brian H Maskell
President, BMA Inc.

Lean Accounting is the general term used for the changes required to a company's accounting, control, measurement, and management processes to support lean manufacturing and lean thinking. Most companies embarking on lean manufacturing soon find that their accounting processes and management methods are at odds with the lean changes they are making. The reason for this is that traditional accounting and management methods were designed to support traditional manufacturing; they are based upon *mass production* thinking. Lean manufacturing breaks the rules of mass production, and so the traditional accounting and management methods are (at best) unsuitable and usually actively hostile to the lean changes the company is making.

Classic examples of these kinds of problems are:

- Lean improvements showing cost increases as a result of the way standard costing applies labor and overhead costs. There is many an excellent lean strategy that has been cancelled or held back because the standard costing system shows a negative impact.
- Traditional performance measurements motivating the people to take anti-lean actions like building inventory, running large batches, "cherry picking" production jobs to maximize earned hours, combining jobs into more "efficient" runs, buying large (so called) economic order quantities of raw materials & components, and so forth. These problems are caused by measurements like *labor efficiency*, *machine utilization*, *purchase price variance*, and - perhaps worst of all - *overhead absorption variance* (and other variances).
- The lean team working hard to eliminate waste from the value stream only to find that profitability goes down owing to the adjustments made by significant inventory reduction. Looking at the other side of this same problem, the finance people are told about all the savings being made in operations but they see (at best) no financial improvement; and often a negative impact.

Underlying these rather obvious issues is a broader problem. Lean thinking turns in its head most of our "given wisdom" in manufacturing. Why? Because the fundamental assumptions of traditional mass production are contrary to the assumptions of lean manufacturing. Lean manufacturing is not a set of interesting and useful shop-floor tools. It is a very different way to manage the business. Yet in many companies embarking on lean manufacturing, these radical changes do not move outside of the production floor. Sure, some companies are applying lean flow in the offices, and others are using lean-style methods in product design; but there is a much bigger cultural impact to changing the way you think about the accounting, measurement, control, decision-making, and management of the enterprise.

Figure 1 shows an overview of the primary topics of Lean Accounting.

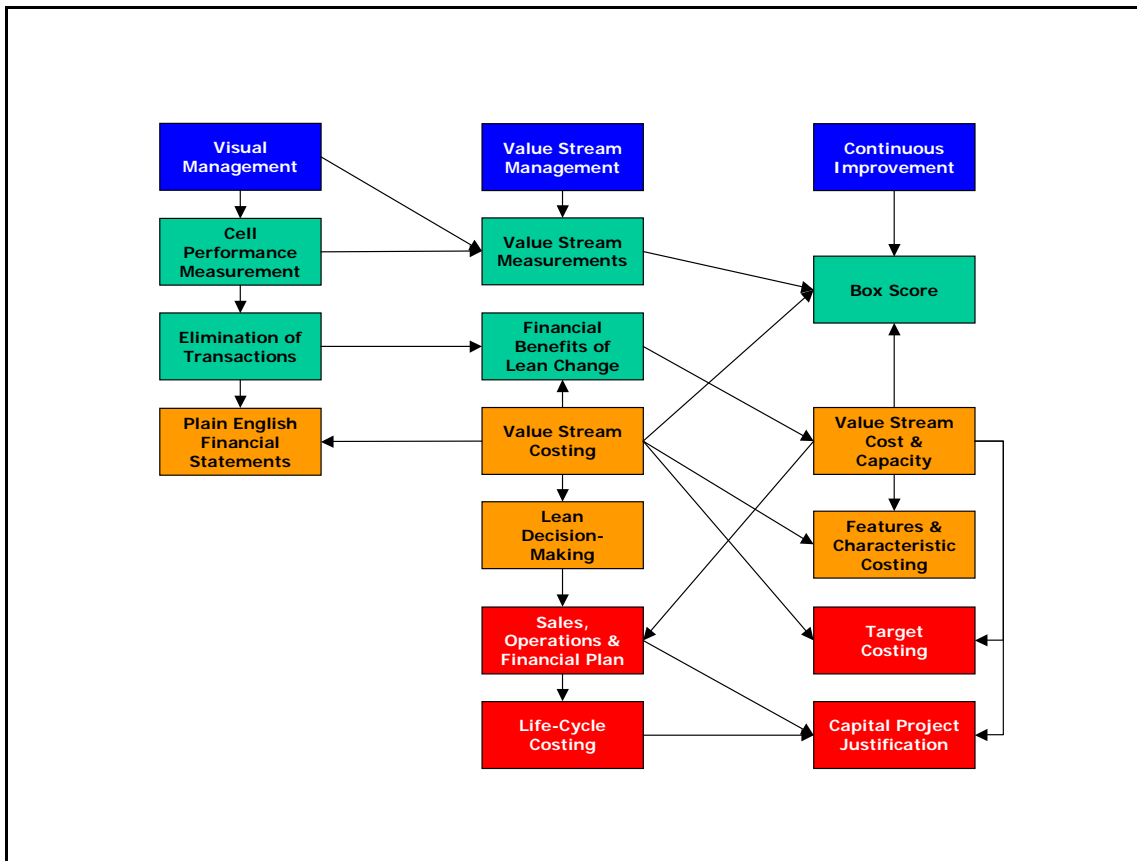


Figure 1 Tools of Lean Accounting

What Will Lean Accounting Do For Us?

There are several tools included in Lean Accounting and they each work together to create a framework for the control & management of a lean enterprise. The benefits of Lean Accounting include:

1. Lean accounting increases sales because it provides better information for decision-making. If you use standard cost information for decisions relating to such things as pricing, quoting, profitability, make/buy, product rationalization, capital investment, and new product introduction, you will very often make the wrong decisions. Standard costs are just plain wrong when it comes to these kinds of decisions. Lean companies need better tools like Value Stream Costing and Lean Decision-Making.

We have worked with many companies over the last few years that have been in the habit of turning down profitable business because standard costs show it to be “low margin”. These companies also tend to out-source products or processes that would be highly beneficial if done in-house, because the standard cost is higher than the out-source price. Figure 2 shows an example of a make/buy decision using value stream costing instead of standard costs.

	CURRENT STATE OF THE VALUE STREAM	VALUE STREAM WITH OUT-SOURCED PRODUCTS	VALUE STREAM WITH NEW PRODUCTS MADE IN-HOUSE
Units	8600	9800	9800
Revenue	\$877,200	\$1,147,200	\$1,147,200
Materials Cost	\$464,400	\$607,200	\$553,200
Employees	\$277,500	\$285,000	\$292,500
Machines	\$39,800	\$39,800	\$41,790
Facilities	\$50,400	\$61,600	\$56,000
Other Costs	\$19,780	\$31,360	\$22,540
TOTAL CONVERSION	\$387,480	\$417,760	\$412,830
VALUE STREAM PROFIT	\$25,320	\$122,240	\$181,170
RETURN ON SALES	2.89%	10.66%	15.79%

Figure 2. Example of Lean Approach to Decision-Making for Make/Buy.

- Lean accounting clearly identifies the financial impact of lean improvements. Most companies use traditional cost-saving models to assess the benefit of lean improvement, and many companies look for short-term cost reductions as a result of lean changes. These companies are frequently disappointed. But the financial people have no other methods to assess the financial impact of lean improvement.

Lean accounting recognizes that the primary impact of waste elimination is the creation of available capacity. The financial impact of lean improvement is almost entirely dependent upon what you do with that newly available capacity. You can lay people off, increase sales & grow the business, or use the capacity in other ways. But you must have a strategy for making money from the lean changes. In our experience, many companies embark on lean manufacturing without having a clear strategy for using their newly acquired lean skills to benefit the company financially. Lean accounting methods make these issues very clear.

Figure 3 shows a “live” example of assessing the financial impact of lean improvement.

		Current State Before Lean Dec-02	Future State Lean Step One Jan-Jun 2003	Future State Lean Step Two Jul-Dec 2003	Future State Longer Term Jan-Jun 2004
OPERATIONAL	Sales per Person	\$224,833	\$224,833	\$224,833	\$277,031
	Inventory Turns	6.5	10	15	20
	Average Cost per Unit	\$31.32	\$31.32	29.88	24.25
	First Time Through	81.00%	95.00%	90.00%	95.00%
	Lead Time in Days	25.00	5.00	5.00	2.50
CAPACITY	Productive	55%	52%	52%	79%
	Non-Productive	42%	40%	12%	12%
	Available Capacity	3%	8%	36%	9%
FINANCIAL	Revenue	\$4,062,000	\$4,062,000	\$4,062,000	\$5,686,000
	Material Costs	\$1,164,184	\$1,164,184	\$1,109,327.16	\$1,552,839.55
	Conversion Costs	\$1,483,416	\$1,483,416	\$1,483,416	\$1,657,500
	Value Stream Profit	\$1,414,400	\$1,414,400	\$1,469,257	\$2,475,660
	Value Stream ROS	34.82%	34.82%	36.17%	43.54%
40.00%	Hurdle Rate	-5.18%	-5.18%	-3.83%	3.54%

Figure 3. Example Showing the Financial Impact of Lean Changes and a Longer Term Strategy.

- Lean Accounting saves money and reduces costs. Have you ever worked out the cost of your accounting systems? Most companies have no idea what they cost because they are deeply embedded into the company's processes. As an organization matures with Lean Accounting they are able to systematically (yet prudently) eliminate 1000's & 1000's of transactions and the reports, reconciliations, & meetings that go with them. These are all waste; and as you bring your processes under control operationally you will be able to eliminate most of the traditional accounting & control systems and their required transactions.

Work orders on the shop-floor together with all the tracking and reporting (or backflushing) of labor hours, job-step tracking, scrap reporting, and other wasteful transactions can - over time - be eliminated. The majority of the *procurement and purchasing* processes can be eliminated as the pulling of materials, components, MRO items, and supplies are brought under control using lean manufacturing and supply chain methods. This includes the traditional AP 3-way match as you begin to expense materials on receipt or backflush them on shipment. Much of the *perpetual inventory* systems can be eliminated as you bring your inventory down and bring it under tight operational control through the use of visual management and pull systems.

The use of Value Stream Costing and Plain English Financial Statements radically simplifies the financial accounting reports, leading to much less work on the part of the financial team and the people who have to use them.

	Period 1		Period 2	
Sales	\$2,956,435		\$3,500,000	
Cost of Sales	\$1,942,360	65.7%	\$2,359,000	67.4%
Gross Margin	\$1,014,075	34.3%	\$1,141,000	32.6%
Total Adjustments	\$298,312	10.1%	\$575,649	16.4%
Net Operating Margin	\$715,763	24.2%	\$565,351	16.2%
SG&A Expenses	\$122,436	4.1%	\$104,333	3.0%
Other Expenses	\$0	0.0%	\$822	0.0%
Earnings Before Tax	\$593,327	20.1%	\$460,196	13.1%

Traditional Standard Cost-Based Income Statement

	Period 1		Period 2	
Sales	\$2,956,435		\$3,500,000	
Procurement Costs	\$271,992	9.2%	\$346,500	9.9%
Conversion Costs	\$1,921,683	65.0%	\$2,317,000	66.2%
Distribution Costs	\$206,950	7.0%	\$241,500	6.9%
Support Costs	\$37,842	1.3%	\$35,700	1.0%
Total Costs	\$2,438,468	82.5%	\$2,940,700	84.0%
Margin	\$517,967	17.5%	\$559,300	16.0%
External Overheads	\$167,068	5.7%	\$197,785	5.7%
Change in Inventory	\$242,428	8.2%	\$98,681	2.8%
Earnings Before Tax	\$593,327	20.1%	\$460,196	13.1%

Plain English Income Statement

Figure 4. Contrasting Traditional Income Statement with a "Plain English" Statement.

Value Stream Costing eliminates the need for traditional cost tracking and the thousands of wasteful transactions that go with it. Value Stream Costing provides easy-to-understand, timely, valid, and actionable cost and profitability information with a fraction of work. Figures 5 shows a Value Stream Income Statement. Figure 6 shows a consolidated Income Statement across multiple value streams.

<i>OEM Products</i>		<i>Current</i>		
<i>Profit & Loss Report</i>				
	Mar-04	Per Unit	% of Sales	
Sales	\$197,341	\$362.760	544	Units
Additional Revenue	\$3,144			
Material Costs	\$71,503	\$131.439	36.23%	
Conversion Costs				
<i>Productive</i>	\$15,625	\$28.722	7.92%	
<i>Non-Productive</i>	\$33,795	\$62.124	17.13%	
<i>Available Capacity</i>	\$5,233	\$9.620	2.65%	
Outside Process Costs	\$10,881	\$20.002	5.51%	
<i>Other Costs</i>	\$9,564	\$17.581	4.85%	
<i>Tooling Costs</i>	\$2,485	\$4.568	1.26%	
Value Stream Profit	\$51,399	\$88.705	24.45%	
ROS	25.64%		24.45%	
Facilities Costs	\$6,375	\$0.43	15,000	Sq.feet
Cash Flow				
<i>Inventory</i>	\$171,797	8.9	days	
<i>Accounts Receivable</i>	\$1,420,858	36.0	days	
<i>Accounts Payable</i>	(\$400,417)	28.0	days	

Figure 5. Example of Value Stream Costing P&L

	OEM Products	Industrial Products	R&D	Sustaining	Total
Revenue	\$ 200,485	\$ 306,269	\$ -	\$ -	\$ 506,754
Units Shipped	544	1,450			
Material	\$ 71,503	\$ 111,431	\$ 12,002	\$ -	\$ 194,936
Conversion	\$ 66,702	\$ 84,829	\$ 21,315	\$ 15,225	\$ 188,071
Outside	\$ 10,881	\$ 32,433	\$ -	\$ -	\$ 43,314
Total	\$ 149,086	\$ 228,693	\$ 33,317	\$ 15,225	\$ 426,321
Profit	\$ 51,399	\$ 77,576	\$ (33,317)	\$ (15,225)	\$ 80,434
ROS	25.64%	25.33%	0.00%	0.00%	15.87%
Cost/Sales \$			6.57%	3.00%	
Cost/Unit	\$ 274.06	\$ 157.72	\$ -	\$ -	\$ -

ADJUSTMENTS	
Corporate Allocations	\$ 5,560
Field Sales Allocation	\$ 9,750
Inventory Change	\$ (889)
Last Month	\$ 120,432
This Month	\$ 121,321
NET PROFIT	\$ 60,453
ROS	11.93%

Figure 6. Example of a Consolidated Value Stream P&L for the Company.

Sales, Operations, & Financial Planning (SOFP) provides an orderly planning that is integrated across value streams. The result is excellent planning with much less work than traditional companies usually expend; and with much better results. SOFP provides monthly rolling budgets that are up-to-date and actionable, and eliminate most of the wasteful annual budgeting processes most companies go through.

4. Lean Accounting motivates long-term lean improvement through lean-focused information and measurements. Lean Performance Measurements are the cornerstone of visual management and control for lean production cells, the value streams, and the overall plant or company. Similar performance measurements are used at the non-production “cells” and processes. These performance measurements are designed to motivate thoroughly lean behavior and to drive continuous improvement at every level of the organization.

Figure 7 shows the set of performance measurements used by one company for cell level, value stream level, and plant level measurements. These measurements all derive originally for the company’s business strategy.

STRATEGIC ISSUES	STRATEGIC MEASURES	VALUE STREAM MEASURES	CELL/PROCESS MEASURES
Increase Cash Flow	Sales Growth	Sales per Person	Day-by-the-Hour Production
Increase sales & market share	EBITDA	On-Time Delivery	WIP-to-SWIP
Continuous improvement culture	Inventory Days	Dock-to-Dock Time	First Time Through
	On-Time Delivery	First Time Through	Operational Equipment Effectiveness
	Customer Satisfaction	Average Cost per Unit	
	Sales per Employee	AR Days Outstanding	

Figure 7. Example of Performance Measurements Reflecting Lean Motivation and Focus on the Company's Strategy

The *Box Score* is used widely in Lean Accounting and shows a three-dimensional view of a value stream; operational, financial, and capacity usage. The Box Score is used to provide an "A3" summarized report of a value stream. It can be used for weekly value stream reporting, for strategic decision-making, for financial impact calculations, and other times when there is a need to show value stream information succinctly. Figures 8 & 9 show the use of Box Scores for different kinds of value stream reporting.

Target Cost exemplifies the first and fifth principles of lean thinking; focus on customer value, and the pursuit of perfection. Using the methods of QFD (Quality Function Deployment) and Value Engineering, we thoroughly understand the value created by a product for the customer. From this we can calculate the target cost for the product (or product family). This target cost is driven down through the value stream to initiate improvement and cost reduction projects to bring the value stream costs in line with the target costs, providing high levels of customer value and the right level of profitability for the company. The outcome is a series of improvement initiatives touching our sales & marketing, product design, procurement, operations, and administrative processes, resulting in significantly better cost and profitability.

	13-Jun	20-Jun	27-Jun	4-Jul	11-Jul	18-Jul	25-Jul	1-Aug	8-Aug	15-Aug	FUTURE STATE
Operational	Units per Person	15.18	15.63	14.70	15.91	15.90	16.59				20.70
	On-Time-Shipment	100%	100%	100%	100%	100%	100%				100%
	Dock-to-Dock Days	6.00									
	First Time Thru	80%	80%	80%	85%	85%	85%				85%
	Average Product Cost	\$343	\$337	\$362	\$338	\$337	\$325				\$262
	AR Days	42	42	42	42	37	37				37
Capacity	Productive	29%	29%	29%	28%	28%	28%				40%
	Non-Productive	54%	54%	54%	52%	52%	52%				33%
	Available Capacity	17%	17%	17%	20%	20%	20%				27%
Financial	Revenue	\$470,900	\$484,750	\$455,942	\$490,050	\$487,910	\$525,635				\$576,375
	Material Cost	\$172,085	\$175,385	\$178,685	\$181,935	\$184,685	\$187,010				\$189,160
	Conversion Cost	\$119,584	\$119,584	\$119,584	\$119,584	\$142,584	\$152,584				\$158,084
	Value Stream Gross Profit	\$179,231	\$189,781	\$157,673	\$188,531	\$160,641	\$186,041				\$229,131
	ROS	38.06%	39.15%	34.58%	38.47%	32.92%	35.39%				39.75%

Figure 8. Example of a Box Score used for Weekly Value Stream Reporting

		Current Value Stream	Remove "Low Margin" Products	Introduce New Products
		Jan-03	Jun-03	Sep-03
Operational	Units per Person	466	395	505
	On-Time-Shipment	92	99	99
	Dock-to-Dock Days	15	7	9
	First Time Thru	65	75	75
	Average Product Cost	\$112.75	\$120.94	\$109.23
	AR Days	42	35	35
Capacity	Productive	24%	18%	28%
	Non-Productive	63%	35%	42%
	Available Capacity	13%	47%	30%
Financial	Revenue Monthly	\$10,667	\$9,866	\$12,800
	Material Cost	\$3,758	\$3,185	\$4,073
	Conversion Cost	\$2,547	\$2,547	\$2,547
	Value Stream Gross Profit	\$4,362	\$4,134	\$6,180

Figure 9. Example of a Box Score to Show Strategic Decisions

There is rarely a need to know the cost of an individual product when using Lean Accounting because the important reporting and decision-making is done at a value stream level rather than a product level. But when product costs are needed, they can usually be calculated simply by using *Features & Characteristics Costing*. Features & Characteristics Costing creates a cost for individual products from an understanding of what truly affects the cost of one product as it flows through the value stream. The rate of flow of product is

a prime driver of conversion cost. We identify the features and characteristics of a product that affect this rate of flow.

Features & Characteristics Costing is a faster, easier, and more accurate way of calculating a product cost. It is also quite intuitive for people across the company, from sales & marketing, through engineering, and production. Figure 10 shows an example of a features & characteristics cost table.

Number of Ends			2	2	3	3	4	4
ORings			Yes	No	Yes	No	Yes	No
Material Cost			\$17.65	\$17.65	\$22.06	\$22.06	\$26.48	\$26.48
Machining Cost	\$6.861	per End	\$13.72	\$13.72	\$20.58	\$20.58	\$27.44	\$27.44
Flating Costs			\$0.79	\$0.79	\$1.19	\$1.19	\$1.58	\$1.58
ORing Costs	\$0.780	per End	\$1.56	\$0.00	\$2.34	\$0.00	\$3.12	\$0.00
TOTAL COST			\$33.72	\$32.16	\$46.17	\$43.83	\$58.62	\$55.50

Figure 10. Example of a Features & Characteristic Cost Table

What is Lean Accounting?

Accounting, control, measurement, and management methods that truly reflect lean thinking and lean practice. Lean Accounting leads to better decision-making by providing accurate, understandable, and actionable cost & profitability information. Lean Accounting saves time and money by eliminating much of the waste associated with traditional accounting & control systems. Lean Accounting motivates lean improvement over the longer-term by providing measurement and reporting information that is thoroughly lean-focused. Lean Accounting enables companies to make more money by identifying the potential financial benefits of lean improvement and developing strategies to realize that profit. Lean Accounting methods such as *Target Costing* and *SOFP* provide short-term and long-term focus on customer value through the value stream, and the team-based continuous improvement required to grow the business, eliminate cost, and improve profitability.

How Do You Implement Lean Accounting?

Lean Accounting does not stand alone. It supports lean manufacturing, lean product design, lean logistics, and so forth. Lean Accounting is the servant of the operation. There is a prudent and orderly maturity path to the implementation of Lean Accounting. As your company matures with lean manufacturing (and other lean processes) more and more of the benefits of Lean Accounting can be implemented and realized.