ACCOUNTING CHARACTERISTICS IN LEAN MANUFACTURING

STOJANOVIC Dragana, - RADOJEVIC Zoran, (SCG)

ABSTRACT
This paper will represent lean manufacturing and lean accounting and principles. Lean manufacturing require different approach to accounting. Lean manufacturing focuses on removing waste and accelerating the flow of goods and services based on customer demand. Lean metrics go beyond traditional financial and accounting measurements. Accounting and financial metrics often measure only the end result. They do not help control the process, solve problems or motivate people. Traditional accounting relies on standard costs and measurements that fail to provide a clear picture of lean success. Lean Management Accounting brings together accounting, control, and performance measurement methods that support the introduction of lean manufacturing and sustain a lean enterprise approach over the long term.

KEY WORDS
lean manufacturing, lean accounting, model, principles

INTRODUCTION
Lean Manufacturing techniques help manufacturers eliminate waste. At the National Institute of Standards and Technology, Lean Manufacturing is: "A systematic approach to identifying and eliminating waste (non-value-added activities) through continuous improvement by flowing the product at the pull of the customer in pursuit of perfection." (4)

Lean manufacturing principles focus on eliminating waste and producing only to meet customer demand. They also typically require a company to move from a functional division of work to work cells where all of the processes needed to manufacture a product or line occur next to each other in sequence. As companies implement a lean approach to manufacturing, accountants have begun to realize that many standard cost accounting practices no longer make sense. Traditional cost management systems are not effective in measuring and accounting for lean initiatives. Traditional accounting thinking provides incentives to over produce and to purchase in quantities at the lowest cost. Placing emphasis on high labor efficiencies and low purchase price will often inflate the investment in inventory. (3)

Traditional cost and management accounting methods were designed for traditional mass production and job-shop manufacturing. Standard costing is positively harmful to any company pursuing lean methods. It motivates non-lean behavior, leads to bad decisions for pricing, margins, make/buy, and other key issues. Traditional costing systems are also very wasteful, time-consuming and expensive. For lean manufacturing to be successful over the longer term it is essential that traditional accounting, control, and measurement systems be replaced by new methods that actively support lean thinking, and are low-waste and lean themselves. Lean Accounting must replace traditional accounting and measurement systems.

Some problems with traditional costing systems in lean enterprise are:
- Provides no useful improvement information,
- Leads production people to do the wrong things (large baths, build inventory, build ahead and earn ours)
- Hides waste by lumping into other overhead and other factors,
- Organized by departments not value stream,
- Provides no useful information for managers and executives to plan cost reduction and improvement,
- Creates waste through transaction laden system. (5)
MATERIAL AND METHODS
Some principles of lean accounting:
- Manage by value streams,
- Constantly identify waste,
- Make everybody accountable for cost reduction at their own level,
- All reporting is linked to improvement cycles,
- Accounting people are primarily change agents integrated with operations teams,
- Consistent and coherent roll-up of cost and performance reports by value stream, program, company and sector,
- Accounting, control and measurement system must themselves be lean.(5)

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:
1. Lean accounting increases sales because it provides better information for decision-making. If we use standard cost information for decisions relating to such things as pricing, quoting, profitability, make/buy, product rationalization, capital investment, and new product introduction, we 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. Many companies over the last few years 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.
2. 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. We can lay people off, increase sales & grow the business, or use the capacity in other ways. But we must have a strategy for making money from the lean changes. 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.

3. Lean Accounting saves money and reduces costs. Most companies have no idea about their accounting cost because they are deeply embedded into the company’s processes. As an organization matures with Lean Accounting they are able to systematically eliminate most of the 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. Much of the perpetual inventory systems can be eliminated by bringing 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. 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.

**Figure 2. Value stream costing (5)**

*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. 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 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. 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 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.

![Diagram of Lean Accounting](image)

**Figure 3. Feature and characteristic costing (5)**

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. (6)
RESULTS
Maskell develop a 4-step Lean Accounting Maturity Model that represent one of his valuable contributions. This model proposes the changes that should be made to accounting systems in parallel with lean changes that are being implemented in other areas of the organisation. Table 1. provides a summary version of this model.

The model is valuable for identifying what accounting changes should be made and at what stage they should be introduced with respect to the maturity of lean implementation. However, there are some limitations associated with Maskells model. There is no guidance as to what specific accounting changes should be made to support each type of decision and it is assumed that companies will move through the four step in a linear fashion.

<table>
<thead>
<tr>
<th>Maturity Steps</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Low-hanging fruit</td>
<td>Maintains current accounting and control methods but eliminate obvious waste within the processes (e.g. reducing detailed labour reporting and variance reporting, reducing numbers of cost centres, simplifying accounting processes)</td>
</tr>
<tr>
<td>2. Removing transactions</td>
<td>Eliminates much of the detailed shop-floor tracking as lead times reduce and WIP becomes immaterial; eliminates unnecessary cost and financial reporting</td>
</tr>
<tr>
<td>3. Eliminating waste</td>
<td>Company operations no longer need to be in step with accounting periods; month ends are irrelevant to the sale of products, manufacture or distribution</td>
</tr>
<tr>
<td>4. Lean accounting</td>
<td>Move to minimal transactions – production completion or product shipment transactions are used to backflush all the relevant information through the control system</td>
</tr>
</tbody>
</table>

Table 1. Maskells 4-step Lean Accounting Maturity Model (7)

DISCUSSION
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 unsuitable and usually actively hostile to the lean changes the company is making.
Changing a company’s accounting, control, and measurement systems must be done carefully. Implementing Lean Accounting requires a prudent maturity path. As the company matures with lean manufacturing and the production, inventory, and administrative processes are brought under control, Lean Accounting methods are introduced.
In the early stages of lean manufacturing new performance measurements are needed, new ways to assess the financial impact of lean improvements are also important. Plus we can begin the process of eliminating wasteful transactions. As the company matures with lean
manufacturing and lean thinking has been applied to much of the production process, then more radical lean accounting can be introduced. The harmful and wasteful standard costing systems can be eliminated and replaced with the simple, accurate, and understandable methods of value stream costing. New decision-making methods are introduced, and further transaction elimination can be achieved. Over time most of the company’s wasteful transactional processes and complex information systems are pared down until the entire process is largely controlled visually. Advanced lean manufacturers base their business on fulfilling the customers’ needs for increasing value. They use methods like target costing to focus the entire value stream team on the need to grow the business, increase value, eliminate waste, and increased profits. Lean accounting is more than a set of tools relating to measurement, capacity usage, value, and continuous improvement. It is the lean business management system. (7)

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.

LITERATURE

CONTACT ADDRESS
Associate Dragana Stojanović, B.Sc., Faculty of Organizational Sciences University of Belgrade, Jove Ilica 154, 11040 Belgrade, Serbia and Montenegro, +381 11 3950 860, stojanovicd@fon.bg.ac.yu
prof. dr Zoran Radijević, Ph.D., Faculty of Organizational Sciences University of Belgrade, Jove Ilica 154, 11040 Belgrade, Serbia and Montenegro, +381 11 3950 819.

Recenzent: Ing. Jozef Mušák, PhD.