

## Value Base Management Tool as A Lean Manufacturing

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### Abstract

Gurus of quality management define the resources in organization and also give the way of effective utilization of resources . In 20<sup>th</sup> centuries number of concept of quality was emerges for optimum utilization of resources. For the resource utilization we has TQM,JIT, QFD and many more.

One of the best technique we have that is “Lean Manufacturing” The history of Lean Manufacturing & Value Management and their expansion as two separate, and stand alone tools over past 5 decades for cost reduction & waste abolition.

Lean Manufacturing has become a world wide phenomenon. It is quite successful in drawing the attention of companies of all sizes. A large number of organizations are following Lean technologies and experiencing vast improvements in quality, production, customer service, and profitability. It focuses on the similarity & dissimilarities between Lean Manufacturing & Value Management and highlights the reimbursement of collaboration & alliance between these two tools. Lean Manufacturing & Value Management have a lot of synergy and the synergized concept (LVM) is much more powerful & useful in today’s cut throat globally competitive manufacturing environment. The integrated Lean Manufacturing & Value Management, if properly utilized in the manufacturing industry, will significantly improve the bottom line profit, enhance value to the customers, and eliminate non-value added & wasteful functions, features, processes, operations & activities in any system. The attempt is made to show the “Value Gap” between customer perception of “Value” and manufacturer’s offer of “Value”.

**KEYWORDS** :- Lean Manufacturing , Management base value , (LVM) “Lean Value Management (LVM)”

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### Introduction :-

Lean Manufacturing and Value Management are both proven cost lessening and constant improvement techniques used in the manufacturing business and industry. The well-established Lean Manufacturing technique is founded on abolition of waste and non-value added operations & activities, lean manufacturing mindset, knowledge and teamwork. Similarly the well-established Value Management is founded on system functionality, knowledge and teamwork. It also gives greatest benefits are from eliminating waste from the many processes manufacturers rely on to anticipate, respond to, fulfill, and serve customers, making it more possible for them to be more aligned to the unmet needs of their customers in the process. The objectives of research are to first provide insights into how manufacturers are tackling the task of transforming lean production lessons learned into lean venture management tool and instituting lasting change at the process level. This includes a discussion of the

lessons learned and steps manufacturing companies are taking to overcome the challenges of making lean enterprise strategies last. Second, this research provides a platform to management to see how your company measures up. Included is a maturity model that shows specifically how your company measures up relative to others in manufacturing.

No single tool or technique can be panacea for all improvements. Unfortunately, some opt for one methodology over others believing that one approach can provide everything they need in all areas such as cost, quality, delivery, savings, process improvements, etc. This raises a point worth considering that it can be advantageous for an organization to use Lean Manufacturing and Value Management concurrently or as complementary to one another to achieve the best & optimal results.

### **Lean Manufacturing & Value Management as autonomous Tools**

Lean Manufacturing and Value Management are methods developed independently in time, with the intent to address different problems.

### **History of Lean Manufacturing**

#### **Lean Manufacturing Means :-**

“A systematic approach to identifying and eliminating waste through continuous improvement, flowing the product at the pull of the customer in pursuit of perfection.”

Eiji Toyoda and Taiichi Ohno pioneer the concept of Lean Manufacturing (i.e. Toyota Production System - TPS) at the Toyota Motor Company after World War II. Lean Manufacturing became the muscle of the Japanese motor vehicle industry because it was able to eliminate waste of the resources, built-up space, investment tools, engineering hours, and new product development time by 50% than that of mass production. Lean Manufacturing caused Toyota to gain market share and revitalize the automotive industry. This revitalization and increased market share caused other automobile manufacturers around the world to become interested in Toyota Production System.

The International Motor Vehicle Program (IMVP) at Massachusetts Institute of Technology (MIT) was created in 1985 to learn Toyota's techniques, and the research & learning of the fundamentals of Lean Manufacturing began.

a factory specialist on the IMVP research team, coined the term “Lean” because it consumed less of everything and eliminated waste. Lean principles incorporate teamwork, communication, efficient use of resources, elimination of waste, and stressed the importance of continuous improvement. As the Lean principles were studied, the IMVP research team incorporated other value improving principles, such as Kaizen ( a continuous, incremental improvement process ) and Value Engineering (VE) technique to achieve Target Costing, Statistical Process Control (SPC), Total Quality Control (TQC), and Computer Aided Design (CAD).

### **History of Value Management**

Value Management is also known as Value Engineering, Value Analysis, Value Control. Value Analysis / Value Engineering (VA/VE) is the process for getting more for less. In a hardware product it is getting more show, better quality and improved customer approval for less cost to produce. functional to an organization or a service activity it is getting desired results faster with fewer resources. Value Analysis / Value Engineering (VA/VE) uses a value equation that says Value is equal to Function divided by Cost (Value = Function / Cost). Value can be

increased by increasing functionality & maintaining same costs or maintaining same functionality and reducing cost or increasing functionality & reducing cost.

Value Engineering applications are rapidly increasing throughout the world. Over 25 countries recognize Value Engineering as an effective management tool and all areas of business, government and society are achieving its benefits. The potential effect of Value Engineering is not a reflection on past performance. It is the result of changing times, advancing technology, new attitudes and a host of new requirements. Value Analysis (VA) was conceived and gestated entirely within a factory environment. At the time its conception it was an era of relative stability and large factory workforce, with concurrent long average working lives of employees with single employers. Particular features emanating from this and the era (1940's – 1960's) would include:

1. Large internal repository of knowledge concerning the factories products and manufacturing methods contained within the factory workforce, a substantial number of which would have a single employer for all their working life.
2. Information on costs, particularly internal costs available in-house.
3. Large workforce and less pressure on time making possible the freedom to take time out for activities such as Value Engineering.

### **Overcoming the Barriers to Becoming a Lean Enterprise**

The greatest challenge to any company in implementing a lean manufacturing strategy is aggressive those processes that cause one of the seven types of waste first, and second, creating a more synchronized manufacturing strategy. When one considers the work completed by AMR Research, Gartner, and the research completed by MIT's Center for Transportation and Logistics, it becomes clear that the same barriers to change are more process- than customer-centric and require a change in how manufacturing is perceived—not as a cost but as a means of better serving customers. From the accumulated work of the sources mentioned, here are the major barriers to manufacturers being able to transform themselves into a lean enterprise:

- 1 ) **Need for greater levels of ownership at the C-level to force change to existing processes.**

What is consistent across industry advisory firms is the fact that all three rank the lack of urgency and lack of support for lean initiatives at the C-level as the major reason why so many companies fail to become lean enterprises. As the self-scoring survey in this paper will show, the lack of support and vision at the top of an organization actually encourages more silted-based approaches to managing lean initiatives at the lower levels of the organization.

**2) A company will become what it focuses on more.**

For those manufacturers that are attaining lean enterprise-level performance, the cultures of their companies have become incredibly focused on metrics, and in fact, the organizations themselves have become so metrically driven that the culture itself embraces the concept of measuring performance and improvement.

**3) Lean positioned for cost-cutting versus customer driven change.**

This is also a critical mistake many manufacturers make, and often becomes the main focus these companies continue to pursue, as opportunities to better integrate their strategies with customers, suppliers, buyers, and service organizations present themselves.

**How Does Your Company Rate?**

Based on the collective work completed at the Massachusetts Institute of Technology (MIT) Center for Transportation and Logistics relating to manufacturers and the theoretical frameworks developed by the MIT Lean Aerospace Initiative, the following benchmarking framework has been created. The 18 life-cycle processes measured in this benchmarking include the following:

**Business Acquisition and Program Management**

- Leverage lean capability for business growth
- Optimize the capability and utilization of assets
- Provide capability to manage risk, cost, schedule, and performance
- Resource and empower program development efforts

**Requirements Definition**

- Establish a requirements definition process to optimize life-cycle value
- Utilize data from the extended enterprise to optimize future requirement definitions

**Develop Product and Process**

- Incorporate customer value into design of products and processes
- Incorporate downstream stakeholder values into products and processes
- Integrate product and process development

**Supply Chain Management**

- Define and develop supplier network
- Optimize network-wide performance

- Foster innovation and knowledge-sharing throughout the supplier network

#### **Produce Product**

- Utilize production knowledge and capabilities competitive advantage
- Establish and maintain a lean production system

#### **Distribute and Service Product**

- Align sales and marketing to production
- Distribute product in lean fashion
- Enhance value of delivered products and services to customers and the enterprise
- Provide post delivery service, support, and sustainability

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In creating a questionnaire from these 18 factors, it's critical to take into account the maturity levels of each attribute as it relates to the performance of an entire organization. It is not enough to simply look at a binary, either/or condition for each factor. It is rather the level of maturity on each of these 18 attributes that determines a company's potential for attaining best practices in the lean enterprise. Using a four-point scale applied to each of these factors yields a self-scoring questionnaire that is shown in the following table. Giving just one answer for each of the 18 factors, calculate your company's score for lean enterprise performance.

#### **How to use Value base tool as a Lean Manufacturing ?**

The following are the five primary elements to consider when implementing lean manufacturing, and they represent the variety of aspects needed to sustain a successful lean manufacturing implementation program.

1. Manufacturing flow - Addresses physical changes and design standards.
2. Organization - Identifies people's roles/functions, training in new ways of working, and communication.
3. Process control - Directed at monitoring, controlling, stabilizing, and pursuing ways to improve the process.
4. Metrics - Addresses visible, results-based performance measures, targeted improvement, and team rewards/recognition.

5. Logistics - Provides the definition for operating rules and mechanisms for planning and controlling the flow of material.

Clearly there is a need for intensive coordination and synchronization of these activities to attain lean objectives in any manufacturing organization. Attaining best practices in lean manufacturing first begins with embracing a lean enterprise vision for the enterprise. In attaining this vision of a lean enterprise, manufacturers are pursuing higher levels of supply-chain visibility, greater levels of collaboration with customers, and increasingly greater levels of real-time integration of manufacturing flow, organization, process control, metrics and logistics throughout sourcing, pricing, manufacturing, and service systems. All of these advantages are combining to deliver higher product quality levels in the process. A lean enterprise is one that aligns itself to the goal of being as responsive and accurate as possible in all responses to customers and eliminating the many forms of waste, for both resources and time.

It's often said that lean manufacturing battles waste and concentrates on how to create a greater value by removing all barriers to accomplishing manufacturers' objectives. There are seven types of waste in which lean manufacturing can assist in alleviating. Alleviating these will result in manufacturers being more efficient and centered on better serving their customers while attaining their goals in the process.

**1. Waste of overproducing** - Producing components that are neither intended for stock nor planned for sale immediately.

**2. Waste of waiting** - Refers to the idle time between operations.

**3. Waste of transport** - Moving material more than necessary.

**4. Waste of processing** - Doing more to the product than necessary and more than the customer is willing to pay for.

**5. Waste of inventory** - Excess of stock from raw materials to finished goods.

**6. Waste of motion** - Any motion that is not necessary to the completion of an operation.

**7. Waste of defects and spoilage** - Defective parts that are produced and need to be reworked.

Table 1: Characteristics of a Lean Production System

	Lean Production Process	System Change Initiative
<b>Focus</b>	Production line (tasks, activities, and cells)	Single organization (departments, processes, suppliers, and customers)
<b>Practices</b>	Cellular manufacturing, quality circles, supplier relationship management, pull production, reengineering setups.	TQM, JIT, Six Sigma, and process re-engineering
<b>Performance Measurement Systems</b>	Takt time, on time delivery, first-time-through, safety performance, production rate  Visibility – Real-time reporting and the use of analytics to track the entire value chains' performance, casual relationships (production tasks and activities), use of single version of the truth and single information reporting	Quality, delivery, process time, cost, flexibility, customer satisfaction; balanced set of strategic metrics (financial and non-financial); new methods of cost accounting (ABC, target costing); top-down communication; internal versus external focus (benchmarking and self-assessment); process management and measures (value delivery)

Table 2: Comparing Lean Production and Lean Enterprise Characteristics

	Lean Production Process	System Change Initiative	The Lean Enterprise
<b>Focus</b>	Production line (tasks, activities, and cells)	Single organization (departments, processes, suppliers, and customers)	Extended enterprise (value streams and all stakeholders)
<b>Practices</b>	Cellular manufacturing, quality circles, supplier relationship management, pull production, re-engineering setups	TQM, JIT, Six Sigma, and process re-engineering	Seamless information flow, integrated product and process capability and maturation, identify and optimize enterprise flow, maintain stability in changing environment, align and involve all stakeholders to achieve lean vision, relationship based on mutual trust and commitment across the extended enterprise, make decisions at the lowest levels, optimize capability and utilization of people, focus on external and internal environment, nurture a learning environment
<b>Metrics</b>	Takt time, on-time delivery, first-time-through, safety performance, production rate	Quality, delivery, process time, cost, flexibility, customer satisfaction	Stakeholder value (effectiveness), overall efficiency, system availability, system-level flexibility
<b>Performance Measurement Systems</b>	Visibility – real-time reporting, casual relationships (production tasks and activities), use of single version of the truth and single information	Balanced set of strategic metrics (financial and non-financial), new methods of cost accounting (ABC, target costing), top-down communication, process management and measures (value delivery)	Stakeholder value measures, uniform set of measures, casual relationships between measures across all levels



**Finding Of Lean Manufacturing with respective Value base management**

Based upon individual applications of Lean Manufacturing and Value Management, different strengths ,purpose, And weaknesses may be observed. The organization should be aware of the advantages or disadvantages of each of these approaches within the context of their own organization’s products, processes & systems objectives. The appropriate strategy can lead to effective concurrent or complementary use of both techniques, if so desired. The comparison between Lean Manufacturing and Value Management tools and the effects of Lean Manufacturing and Value Management attributes are shown in Table.

<b>Finding Of Lean Manufacturing with respective Value base management</b>		
Lean Manufacturing Tool	Value Management Tool	Purpose
VSM (Value Stream Mapping	FAST (Function Analysis System Technique)	Details system functions/process steps and arranges them in dependent order/ Sequence to visualize correlation
Process / Step Listing	Function Listing	Lists all input & output functions/variables As well as categorizing them relative to one Another (e.g. Lean Manufacturing by “Processes’, and Value Management by “Basic” & “Secondary”
Cost Pareto	Cost Pareto	One-dimensional analytical method to identify opportunity areas based in one relation (e.g. “Cost by Waste” in Lean Manufacturing and “Cost by Component” in Value Management
Cost-Process Worksheet	Cost-Function Worksheet	Correlates system components/process steps to functions performed using an arithmetic weighting method to discern significant areas of opportunities/risks.



<b>Attributes</b>	<b>Lean Manufacturing</b>	<b>Value Management</b>
Effectively Reduces Cost and Increases Value	High	High
Customer Focus	High	High
Workforce Participation	High	High
Visual Analytic Tools	High	High
Effective Process/Product Design	Low	High
Systematic Enterprise Approach	High	Low
Rigorous Analytic Tools	Low	High
Optional Tactical Use	Low	High
Effective Enterprise Transformation	High	NA
Rigorous Creativity Tools	NA	High
Low Cost Entry	NA	High
Rigorous Risk Management	NA	Low

### **Recommendations for Driving Lean revolution**

- 1) Greater system-level integration with downstream stakeholder values and greater visibility into customer demands
- 2) Delivering greater process standardization and greater cross-functional communication eliminates wasted time, duplicated processes, and lost opportunities to better serve customers.
- 3) Integrate and reward lean initiatives success and include it in both strategic planning and production systems planning.
- 4) Integration of environmental protection, compliance, health and safety systems corporate wide.
- 5) Allow the customer to have a seat at the development table.

### **Conclusion :-**

Lean manufacturing gives the way to define the organization to achieve the value base management ,Lean Manufacturing gives solution, based on an organization's needs and resources, is to adopt and practice both Lean Manufacturing and Value Management as key business strategies. Even if not used, interdependently, the increased capability and scope can be beneficial. If used in a complementary manner, the advantage of each method are compounded and amplified to enhance the overall effectiveness to the user.

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