

VALUE STREAM MAPPING (VSM) BASIC TRAINING TO INCREASE INDUSTRIAL PRODUCTIVITY

Zulfa Fitri Ikatrinasari dan Kosasih Kosasih
Universitas Mercu Buana Jakarta, Indonesia.

ABSTRACT

Value stream mapping (VSM) is one of the tools in lean manufacturing that can be used to improve the efficiency of a company. VSM can describe material flow and information flow from upstream to downstream, from suppliers to consumers. VSM can be used to identify waste through sorting each activity into value-added or non-value-added activities. VSM training that begins with providing understanding of the concept of lean manufacturing is expected to increase the ability of workers to improve and enhance the performance of their companies. This training gives good results, seen from the results of discussions and presentations of each group in a given case study.

Keywords: Value Stream Mapping, Lean Manufacturing

1. INTRODUCTION

Situation Analysis

Industrial competition is so sharp at this time requires companies to have high competitive advantage. Companies in manufacturing and logistics must make continuous improvements and make inroads in increasing efficiency and productivity. The company must eliminate any waste that occurs in its work processes.

Increasing efficiency and productivity is not enough anymore to be done in conventional ways. Companies need to apply systematic methods in planning and improving the processes they do. Increased productivity requires implementative "methods".

One important method to be applied in increasing company productivity is Value Stream Mapping (VSM). This method is one of the important techniques in the Lean System that can help analyze the material flow and information flow as the product goes through the entire business process that creates value, from raw materials to finished products delivered to customers. VSM is the main key in conducting business process improvement. By mapping the entire process end-to-end, the company can identify waste and activities that do not provide added value, then prioritize improvements, so that company performance will be obtained.

Identification and Problem Formulation

Based on the situation analysis above, the following problems can be identified:

1. How important is value stream mapping in improving productivity
2. How to understand the added value and non-added value in an operational process.
3. What is the classification of waste that has an impact on productivity and work effectiveness.
4. How to identify problems in each process.
5. How to build the ability to map flow and design future-state value stream maps.
6. How to make plans to implement value stream mapping to improve productivity

Purpose of Activities

This activity aims to introduce and practice the Value Stream Mapping method to workers in order to implement VSM in their workplaces so as to increase the productivity of their companies.

Benefits of Activities

After participating in community service activities, workers are expected to be able to:

1. Understand the importance of value stream mapping in improving company productivity.
2. Understanding the added value and non added value in an operational process.
3. Understanding the classification of waste that has an impact on productivity and work effectiveness.
4. Understand how to identify problems in each process.
5. Build the ability to map flows and design future-state value stream maps.
6. Able to make plans to implement value stream mapping to improve productivity.

2. MATERIALS AND METHODS OF IMPLEMENTATION

Troubleshooting Framework

In an effort to increase the participation of tertiary institutions in the community especially within the existing community institutions / organizations, Mercu Buana University through the Community Service Center (P2M) needs to see and actively participate in helping to contribute directly. For this reason, the research team proposed a value stream mapping (VSM) training program for workers in the manufacturing industry sector.

Value Stream Mapping Training activities are expected to help workers increase productivity in the company where they work. Value Stream Mapping is one of the tools (methods) for lean systems that can eliminate waste by identifying value added activities and non value added activities.

Target Audience

The target audience of community service is carried out by workers at Manufacturing Industry In Bekasi, West Java.

Activity Method

The basic VSM training methods conducted are:

1. Screening an example of lean manufacturing application
2. Submission of lean manufacturing basics
3. Submission of value stream mapping material
4. Case studies and exercises for making VSM current.

3. RESULTS AND DISCUSSION

Value Stream Mapping (VSM)

Value Stream Mapping itself is a very important tool in implementing lean manufacturing. VSM can be a good start for companies that want to implement a lean system because it can show activities either adding value or not adding value to a product that uses the same resource in a process that starts from raw materials to consumers.

Value Stream Mapping is a method of mapping to map value streams (value streams) in detail to identify the waste and find the causes of waste and provide the right way to eliminate it or at least reduce it.

Both current maps and future maps in VSM consist of three main parts, namely:

1. Production process flow or material flow

This process or material flow is located between the information flow and the timeline. Process flow is drawn from left to right. Subtask or subprocesses and parallel processes are drawn in identical shapes below the main flow. The process flow makes it easier to see between processes that have subtasks and parallel processes with other processes.

2. Communication / information flow

The information flow in the value stream mapping is usually located at the top. The existence of this information flow, can see all types of information and communication both formal and informal that occur in the value stream. The flow of information can also track information that is not necessary and become non-value added communication that does not provide added value to the product itself.

3. Time line / distance traveled

At the bottom of the VSM there is a series of lines containing important information in the VSM and commonly referred to as timelines. The two lines in the timelines are used as a basis for comparison of improvements to be implemented. The first line at the top is called the Production Lead Time (PLT). This PLT is the time it takes for the product to pass through all processes from raw materials to the hands of customers and usually in units of days. PLT which is just below the gap between processes is added to the total PLT placed at the end of the process. The second line at the bottom is the cycle time of all processes in the material flow and written on the line directly below the process. The total of all cycle times is called the total cycle time and is written at the end of the process below the total PLT. The last line that lies below the timelines is the distance that is the distance traveled by products, operators, electronic forms along the production process flow.

Steps Of Making VSM

In the design of VSM there are several stages that must be passed, namely:

1. Product Family Identification
2. Develop VSM for actual conditions
3. Develop the Future State VSM
4. Develop Improvement



Figure 1. Implementation of training activities

Following is the understanding of the steps for making VSM:

1. Product Family Identification

Each product produced must all be grouped into one family based on size or based on other considerations. The grouping can be done easily, how to see the similarity of processes, forms and raw materials of these products. Then make a table like a table to make it easier by using the matrix method.

The purpose of this identification is to make the process of mapping focus on products that have less good processes and simplify them so that the effort to process data collecting is easier and faster.

2. Develop VSM for actual conditions

After we can make a product mapping, then our task is to make the actual condition VSM. This process with the help of product mapping that has been done above, then what needs to be done is to only focus on the critical and have a big impact. As makers we certainly understand which products need to be analyzed immediately.

The next step is to brainstorm with the experts and key people responsible for the process from product design to the product in the hands of consumers. Then, go to the field by seeing the process directly, observe the process directly with the provision list that we have from the key person. Next make corrections and facts on the ground, such as whether related to time, inventory and items if it is important such as the number of workers, waiting time, etc. Make a table to facilitate field investigations.

Continue to make an agreement relating to the symbol that you will use in making VSM. Do a VSM draft and make sure to have a discussion again with the key person and see which processes need further follow-up. To facilitate mapping the current state we can use VALSAT (Value Stream Analysis Tools) and use other mapping tools.

3. Develop the Future State VSM

Actual conditions now if you have mapped, now is the time we create as hard as we can to create a future state. What should be considered in making a future state, previously it needs to be understood that future state is an ideal condition to be achieved by the system in doing the process, for example, such as fast production lead time, if the current is 2 hours / product, future state is 1 hour / product.

What must be considered to create a future state is the Company's KPI, the company's capability, and of course people. With these three considerations in mind, the hope of a future state created is a reflection of the company's goals.

4. Develop Improvement

After the future state is made the next step is how we and our team make a step or program to change current into future. For example to make lead times faster and in accordance with future states can be done by implementing cellular manufacturing, grouping processes that have similarities to reduce travel time and work in process.

After we have a clear and structured program, what we have to do is implement it well. How to? Make everyone aware that the current state needs to be improved with a future state that has been made by the team. Invite a discussion of all stakeholders, make a commitment to the achievement of the program. Furthermore, the team must be able to maintain the program into an SOP and culture in the company or system.

Jax Tax Case Study

So that the understanding of VSM becomes more inherent and ready to be implemented in their respective companies, at the end of the training there will be a case study exercise to make current VSM.

Results of Training

By using A1-sized manila cardboard and yellow, blue and red post-it paper, participants complete the jax tax case study in groups. One group consists of four or five members. From the results of the training on the Jax Tax case study, it is known that most participants have understood what VSM is and can complete the case study very well.

4. CONCLUSIONS

The results of the training show that the participants have an understanding of lean manufacturing, understand the value stream mapping and can implement the VSM method in solving Jax Tax case study problems.

Limited time in training, causing training can only provide training in making current state mapping, while future state mapping material is only delivered in the form of theory not yet in case study exercises.

REFERENCES

- Carroll, B.J (2008), *Lean Performance ERP, Project Management, Implementing the Virtual Lean Enterprise*.
- Froon, B. (June 2010), supervised by Dr. Ir. C.M.H. Kuijpers, Tilburg University, *Implementing lean management globally, "Lean around the world!"*
- Green, K. and Bowles, S. (2011), and United States Environmental Protection Agency (November 2011), *Lean:Excellence in Government Improving Environmental Agency*
- Haryanto, E. I. (2014). *Usulan Penerapan Lean Service di Sub Direktorat Standarisasi Direktorat Kelaikan Udara dan Pengoperasian Pesawat Udara Direktorat Jenderal Perhubungan Udara Thesis Magister Teknik Industri*. Universitas Mercu Buana. Jakarta.
- LeanMap. (2013). *Lean Application in Service*, Retrieved from <http://www.leanmap.com/lean-service/#sthash.ILMwHpQ8.dpuf>
- Mehmet C, David & Daniel, (2011), *Customer value, value stream, continuous flow, pull process and continuous improvement*.
- Nielsen, A. N. G. Associates Inc. (2008), *Getting Started with Value Stream Mapping*.
- Ross & Associates Environmental Consulting (2009), Ltd. *United States Environmental Protection Agency (2009), Lean in Government, How to Plan and Implement Successful Lean Initiatives at Environmental Agencies*.
- Setyaningsih, I. (2013). *Analisis Kualitas Pelayanan Rumah Sakit terhadap Pasien menggunakan Pendekatan Lean Servperf (Lean Service Dan Service Performance)*. DOI: 10.12928/Spektrum.v11i2.1730
- Sarkar, D. (2008). *Lean for Service Organizations and Offices*, Milwaukee, ASQ Quality Press.
- Sanker, E.A. (2013), *Wise Geek - What are lean services* Edited By: O. Wallace, (Last Modified Date: 17 October 2013). Retrieved from <http://www.wisegeek.com/what-are-lean-services.htm>
- Turley, C. (2012), *Lean in Service and Non-manufacturing*. Retrieved from <http://c2plusconsulting.com/2012/02/lean-in-service-and-non-manufacturing/>
- Womack, J. Jones, D. and Roos, D. (1990), *The Machine that Changed the World (often referred to as the Toyota Production System)*.