Enhancement of an Effective Training in Manufacturing Company

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ABSTRACT

The purpose of this paper is to disclose of how trainings were conducted in a manufacturing company towards an effective training. A company was selected for case study. The company is one of the leading companies in composite technology which situated in Melaka, Malaysia and currently active in educating staff towards implementation of Lean Manufacturing system. This paper is only focused on the training of Value Stream Mapping (VSM) which considered the new method for Lean manufacturing system in the company. This paper will disclose the activities which applied during class and the success story in order to have 100 percent participation and training effectiveness after class. In addition, it's expected to guide the trainer to make preparation before, during and after class in industrial practice.

Keywords

Training, Value Stream Mapping (VSM), Lean Manufacturing, Manufacturing Industry

1.0 INTRODUCTION

Training is a must for individual which do not have knowledge. Training will help an individual to understand and able to perform or to implement on what he or she has been learned from the training. Training is considered never ending activities. However, in order to provide a good training, an individual must have a good knowledge in the particular area and have a good preparation. The effective training will encourage trainee to motivate himself and able to work smartly and excellent.

Knowledge is created by people and reflects to their know-how and the involvements in education, experience, thinking, decision making and all other capacity for creating choices and taking action. In addition, knowledge is human capacity (potential and actual ability) to take effective action (Mathew, 2003).

Learning is different from knowledge and has been defined as 'the acquisition and integration of knowledge so that it may be used and applied'. Learning uses knowledge and harnesses its application value. Bloom's Taxonomy identifies different learning levels. According to Bloom taxonomy of learning there are six levels that represent the strengths of learning: knowledge, comprehension, application, analysis, synthesis and evaluation (Mathew, 2003).

2.0 VALUE STREAM MAPPING

Value stream mapping (VSM) is a method to depict current and future, or ideal states of the manufacturing system. It depicts both the material flow and the information flow and is used as an aid to develop the implementation plan for installing a lean system (Wader, 2005).

It is a very visual concept, which uses simple icons to represent key manufacturing functions and encourages quick pencil diagrams on large sheets of paper to illustrate the whole

manufacturing process. VSM helps to visualize flows, identify areas of work, create a common language for talking about the manufacturing process, pull together lean thinking principles, illustrate relationships between information and physical flows and create buy-in from the senior team undertaking the 'bigger picture'.

Figure 1 shows the example of a value stream map. In this approach, all activities, inventories, and information flows are carefully "mapped" and analysed. The approach is similar to the heavily used process mapping, but adds a careful analysis of inventory (size, functions, and costs) and information flows, both into and out of various process operations (Chapman, 2006).

This tool really works best for repetitive operations, especially where a single product or family is made. However, where a variety of product exist (i.e. before rationalization or cell groupings) focus on a specific value stream (or product) will avoid confusion over the different process routes, and will serve to highlight the issues of waste.
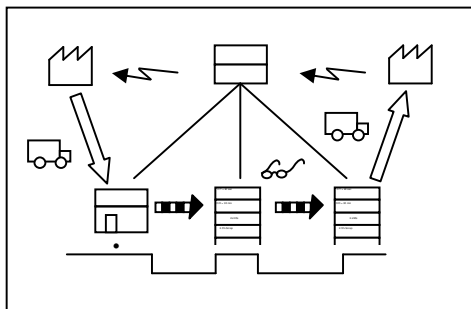

Figure 1: An Example of Value Stream Map

2.1 ELEMENTS OF VSM

The following are the five (5) major elements for a VSM:

a. Process Flow / Process Map: includes all processes /activities in operation which covered incoming material to finished goods.
b. Information flows: includes all information mediums which related to customer, supplier and operation.
c. Material flows: includes all material movement started from incoming material, work in progress (WIP), finished good, logistic, product to customer.

d. Time information: includes all related time which affected product lead time.
e. Databox: includes all the required data which consist of Non-Value Added (NVA) and Value Added (VA) information.

2.2 TYPES OF VSM

There are three types of VSM.

a. Current state map: to show the current status of operation performance and performance measure map.
b. Future state map: planning or improvement sheet /map.
c. Ideal state map: the situation of the best achievement/performance.

3.0 VSM TRAINING

VSM involves several icons to represent the information in the five major elements of VSM. For the training purpose, trainers are focused on read and draw VSM (including current and future state VSM). These two aspects are very important and required trainee to understand for debate and improvement purpose because the top managements have been decided to use VSM as a platform/language.

Before training, the trainers have been given the target from top managements. Trainer is wanted to train all the representative area because VSM have been declared the compulsory lean tool to be applied. In addition, VSM also considered by top management is the first lean tool must be applied to define the current status of overall operation performance.

According to that purposes, trainer has decided to train at least 25 trainees per group which consist of managers, assistant managers, senior engineers, engineers and team leader. The trainees are required to attend lean basic training as a pre-requisite to attend VSM training. The training duration is 2 days of working periods. This training is compulsory for target group staff who directly involved in manufacturing operation. The totals of target group staff are 200 and have to be trained before year 2008 in 10 months durations. Table 1 shows the training schedule for target group.

Table 1: Training Schedule

Grp	2007									
	M	A	M	J	J	A	S	O	N	D
G1	▉									
G2		▉								
G3			▉							
G4				▉						
G5						▉				
G6							▉			
G7									▉	
G8									▉	

Base on Table 1, the first training was conducted on Mac. This group is considered pilot group and involved all lean committee. The objectives for this pilot group are to review the training syllabus and activities. After 2 days training, a post mortem was conducted. The main purpose of post mortem is to ensure the next training without mistake.

The next training is conducted on Apr, followed by May and June. July is for second training review. Some documentation had changed. This is because VSM electronic template was introduced. There is no training in October and December due to several factors which can't be avoided.

3.1 TRAINING METHODOLOGY

There are five methods of training were used in the VSM training. There are:
a. Lecture: the introduction of VSM, icons, elements and all relevant subject to VSM.
b. Game: the game is named dummy factory, the game is conducted to simulate a dummy operation system in the class. The trainees are required to draw VSM and present to others. Trainer will comment the VSM and do correction if the VSM is wrong base on the five elements of VSM. The game is considered as an active learning activity.
c. Test (Theoretical): base on what have been learn from class. The test is covered the most highlighted knowledge in VSM. The result is used to benchmark and identify the most potential staff to be a VSM trainer.
d. Case study: base on actual situation at the factory. The result used as a benchmarking result for next VSM project. To gain trainees understanding through real case study at factory / operation.

e. Project: related to trainees' expertise area and two weeks duration will be given to complete the project. The project must have real / actual information on current status operation value stream.

3.3 TRAINING OUTCOME

After attending this course, participants will able to:
a. Explain the VSM principles and practices related to factory operation systems and lean manufacturing.
b. Draw a current VSM and identify any opportunity for improvement
c. Draw a future state VSM effectively.
d. Use VSM as a medium communication in operation for productivity improvement.

3.4 TRAINING CONTENT

The training is two days in-house training and conducted by internal trainers. Through a good collaboration with Local University (UTeM), a few of lecturers are involved in selecting participants, development of training tentative, training activity, training duration, project deployment and etc. in order to have an effective training. Below are the training contents for the training:

Day 1
- Ice breaking
- VSM awareness
- What is VSM? Why VSM is chosen?
- The importance of VSM related to factory Operation.
- VSM Elements.
- Current State VSM.
- VSM Icons.
- Games: My Dummy Factory
- Discussion & Summary Day 1

Day 2
- Future State VSM
- Company Vision & Mission
- Games: My Kaizen Factory
- Case Study: My VSM
- Project Selection
- Discussion & Summary Day 2/overall training
- Test

3.5 AFTER TRAINING ACTIVITIES

To have a good after training result, VSM Committee has been formed. The committee involves project leaders and staff who are committed to make sure the realization of VSM with permission from top management. The committee is responsible to ensure all activities in VSM are happen as well as the planned. In addition, the committee also has been trained to be trainers for the next VSM training.

All the VSM projects need to be presented to top managements to report the current state value stream in operation for top managements concern. This 30 minutes presentation is prepared to create a culture whereby VSM is used to be a language of discussion towards continuous improvement in lean manufacturing system.

For data validation, VSM committee has used pilot study to ensure the data / information in a VSM is correct. In addition, the staffs are required to update the data for marketing purposes. By having VSM, everybody is easily to search for what kind of opportunities or improvement can be made towards world class manufacturing.

4.0 CONCLUSION

As the conclusion, an effective training is crucial to ensure what have been planned are happen. Better knowledge, experiences, communication, delivery methods, training activities and etc. are the key points of success. In addition, training contents and the activities after training must be aligned with company vision and mission. The other point is that, a good collaboration with local university (UTeM) were benefited cost saving for training, time spent for training plan and knowledge transfers.

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