

## **“Implemetation Of Lean Manufacturing In Small Company”**

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### **ABSTRACT**

This research has been carried out within the field of Lean Manufacturing. It has been goal to investigate how a small Industry could implement the philosophy in own concerned. The work with this paper has been carried out in cooperation with Pyrotech Pvt. Ltd. with the goal to create recommendation for the company in how they could implement Lean manufacturing. In order to answer the question what should a small industry focus on to implement the Lean Production concept successfully, an investigation in two middle sizes industries in the Rajasthan Udaipur (India) were visited. One interview was carried out with a responsible manager at both the two companies and a questionnaire was handed out to workers, in order to compare the Lean companies with company that not are working with Lean. The aim was to see if there were any large differences between the companies in the way they are working and inform the employees. The two companies were found in different Indian technical production magazines; theywere both middle sizes companies that had been working different long with the principles.

The interview and questionnaire did show that a company should implement Lean Manufacturing if they wanted to accomplish more in the own organization with teamwork and get more busy from the employees. They had realized that they could not stay in the traditional Taylorism ways of working when the employees do not need to be involved in the planning and steering of the work. It is important that all co-workers know the vision and goal why a company are implementing Lean Production.

The interview companies did almost follow the same pattern whit the implementation and that this had Work quite well. The idea is not try not to do any different between manufacturing and administration Departments with the implementation. Run the same basic training for all employees in the beginning. Go to other companies that has implement the way of working after the first course to visual the information in how it could work and then start to change the own organization in a clear visible

area of the company so everybody could see that something is going on.

It is important to realize that Lean Production is not a successful tool that you can apply in a company and expect success straight away. It is a way of thinking; it is important to understand the concept and go the whole way in the company when implementing it and also to work with the company's suppliers and consumers. This Paper has tried to give some recommendation to a small company in what they should think about if they choose to implement Lean Production. But it is difficult to give any over gripping suggestion in how a company should do, instead be honest about the own organization, understand that no process are fulfill, it could always be better. A common mistake is to take on too much, pick a few boulders to work on each year, it took Toyota, the company behind lean production, more than 30 years to develop the system, and they are still improving it.

### **1. Introduction**

#### **1.1 Background**

The concept of Lean Production arrived to India in the mid 1980's from Japan and United States of America, but it was mostly the larger companies that adopted the techniques. Now, middle and small companies has started to adapted the Lean production concepts and several articles is written about the concept that has become 'extreme production makeover' (NyTeknik, 2006). After been studding Lean Production theoretical, an interest started to grow in how the concept actual works out in Indian companies and how it could be implemented in a small 'none Lean' organization. The questions that this Paper investigates concern what some Swedish companies made change their way of working and how difficult it is to change over an old production strategy and change established routines into a new way of working. Which parts should a small company focus on to successfully implement Lean Production? A big part of the Lean Production philosophy is to make the leaders actually go to the place where it happens. In a factory for example, go to the workshop and

understand the process, be in the process and work for the process.

### 1.2 Purpose

What is Lean Production and what should a small company focus on to implement the concept successfully? This was the major question to be investigated in this work. A challenge is that the way of thinking is original Japanese and the Japanese cultures are different from the Indian culture. How is the concept working in companies in India and which of the Lean Production concepts could work at a small Indian company? The Paper focuses on the concept of Lean Production with nine underlying questions.

### 1.3 Company Goal

- Why should a company start to implement Lean Production?
- Which strategically goal should the company have in that case?

### 1.4 Implementation

- How should a company implement Lean Production?
- What should a company focus on?
- Which time perspective should a company have?
- How should a company plan and arrange the work?  
Employees
- How does a company motivate and educate its employees within lean work?
- How much time will a company have to spend on Lean Production in its Daily work?

### 1.5 Results

Which benefits could a company gain when changing into Lean Production? This dissertation will just investigate one small company in the manufacturing business. It will investigate the possibility to implement this production philosophy at this company. With the focus on how four other companies have done.

However, four other small companies are studied in respect of what they experienced When going through a similar change process.

### 1.6 Research Strategy

The work with this thesis was divided into three phases:

1. Concept phase
2. Interview phase
3. Evaluation phase

## 2. Research Method

### 2.1 Investigating a small company

To understand how a small company in Indian is working without Lean Production, an investigation on site in a company was necessary. Most practical was to only chose one company to be

investigated more careful and this was just to be able to follow the time limitation and restriction. Contacts were taken with some small companies around the Gothenburg region. One company accepted to be investigated in how they are working right now and how it could be possible for them to implement Lean Production. The main reason for their acceptance was that they had increased their production with over 50% the last year and the forecast for the next year were at the same level. They needed someone to investigate if it were possible to effective their production with the same personal.

### 2.1.1 Pyrotech Pvt. Ltd

The company was Pyrotech Pvt Ltd. which is located in the Udaipur Rajasthan and has around 100 employees. They develop Electronic Meters

### 2.2 Interviews in two companies.

#### 2.2.1 Peacocke Furniture and Plastic Pvt. Ltd.

Peacocke Furniture and Plastic Ltd has since they started working with Kaizen been from five years in a row for companies that are successful with in continuous improvement.

#### 2.2.2 Pacific Mines Pvt. Ltd.

Pacific Mines has since they started working with Kaizen been from nine years in a row for companies that are successful with in continuous improvement.

## 3. Interview Questions Pattern

In order to investigate the thoughts behind why these four companies chose to implement Lean Production, how they implemented the lean concept, how they work with it and what results. Questions were developed based on the 14 principles Liker (2004) writes about. Maybe had they chosen the five principles that Womack, Jones & Roos writes about. Or if they had chosen a more India way to work with Lean Production, that could be helpful for small companies if the chose to implement the production system.

### 3.1 Interview Questions

#### 3.1.1 Company Goals

1. What did you want to achieve with implementing Lean Production?
2. Why did you start to implement continuous improvements?
3. Did you study and compare yourself with other companies before the start of the improvements?
4. Does the company have a strategically goal that everybody knows about?
5. How far into the future are these strategically goals?
6. Do all workers know what they should do to support these strategically goals?

7. Do you have some time limited target that you are continuity are following up?

8. Are the work with contentious improvements well support of the board?

### **3.1.2 The implementation:**

9. How did you think when you planned the implementation?

10. Which time perspective did you have when you started the work?

11. Did you plan the work in different phases?

12. In which area did you focus on first?

13. How did you educate your staff within continuous improvements?

14. How did you motivate your co-workers when you started?

15. How do you motivate your workers now when the process are rolling?

16. How does your company share information?

### **3.1.3 Employees**

17. How were you thinking that your employees would contribute?

18. How much time involves continuous improvements?

19. How do you check your work with continuous improvements?

20. Are everybody committed with the Lean work?

21. Are the workers more committed to the work now compared to before?

22. How is the work order from that an idea is born to it are fulfilled?

### **3.1.4 The Results**

23. Have the company gain any benefits, economical with profit or more commitment from the staff since implementation?

24. Has the work with Lean Production changed the way you have been working?

25. Do you evaluate and develop your system with continuous improvements?

## **4. Interview**

### **4.1 Company Goal**

Questions 1 to 8: Why should a company start to implement Lean Production and which strategic goals should the company has in that case?

Two of the four interviewed companies decided, in order to develop themselves, to introduce Lean Production to get more engagement from the employees. They wanted to accomplish more with teamwork so a workgroup together sees to the possibilities and discover problems closer to the work place where the problems are. The companies also wanted a better and more efficient organization with higher quality.

They had realized that they could not stay in the traditional Taylorism ways of working when the employees do not need to be involved in the planning and steering of the work.

The idea that most of the companies had was that everybody in the companies should start working in the same way and not to separate different questions as; economy, working environment, environment issues or quality. Customers want long partnerships and we have to develop ourselves to stay in business. Companies have to make sure you get better all the time and Lean Production is a good way of doing that.

It is important that all co-workers should know about the vision a company has for implementing Lean Production. One way as Pyrotech has done is that they have let different groups been away and discussing the vision, how that affects the group and also the targets the group would need to have for the next year in order to fulfill the company goal. One other way as Peacock has done is to create it is own book where the vision, the targets, but also which methods are to measure them, are printed in an easy way so everybody could read and understand. All the companies has measurement methods, not just Peacock Furniture Ltd, where they measure, for example, economic, quality, working environment and environment issues continuously. Every area are not measured at the same time. One company divided it up and touch one area each month so after four months they were back at the starting point and could compare the differences. It is important that all work with continuous improvements is well supported by the board and that they realize that it takes time in the beginning to change the way of working to a more Lean Production way.

### **4.2 Implementation**

Questions 9 to 16: How should a company implement Lean Production, what should they focus on, which time perspective should they have, and how should they plan and arrange the work?

In order for the companies to develop them to get more engagement from the employees, better, and a more efficient organization all four have educate everyone in the company, or are on the way. It is two courses that the companies have educated the staff with, the first one are the Lean game. The second are a 5S course. Not all companies did it in this order and some companies develop improvements groups before the different courses to the group together did get the training, some afterwards. They all follow almost the same concept, train first, let the concept be understood and the implement it in an easy visible area of the company so everybody sees that something is happening. They also divided goals along the way of the implementation. In order to do small steps along the way they also looked back and pointed out what they had achieved. In the beginning it could be a good way to test very different techniques in order to test what is working on the own company. All the companies had a implementation plan in how they

should have divided the organization and how the education should be divided. Then they developed a future state plan to get the work sustainable and as one company said 'the time limit is to focus on the eternity'. Because implementing Lean Production is not a project that has a time limit. It is a philosophy, a way of working.

Try not to do any difference between manufacturing and administration departments with the implementation. One company do have a weekly information meeting in the factory with at least one from every group that reports back to the group, so everyone in the company knows what is going on, which orders are being worked on now, how the results from different analysis was, and which different group based improvements jobs that are being done. The companies have been very clear about that the work is being done for the employees and no one else. If the company wants to stay in business in this tough market all the employees have to work together. The interview also discovered that the staffs has realized that it is more fun to work when you can change the work place and are being encouraged to ask why. You have to be one step ahead of your competitors and one way is to have worked with continuous improvements. Everybody has a possibility to contribute and to change the workplace that motivates. One important part is that the companies' productions managers often are out in the organization and talk to them at the worksite. It is very important that decisions are being taken out there, discussing their problem there and not in the office. It is important for everybody to realise that if nothing happened there will be no improvement. Pyrotech also put up before and after reports to show that it has become an improvement and what the benefit was of it. In all of the interviewed companies, every team had an information whiteboard where all relevant facts about the groups production and improvement was put up. Teams then had morning meetings every day around the board with the production manager to discuss the days work, yesterdays result, sickness, improvements, improvements suggestions and other issues. Pyrotech had a fixed agenda that every group was followed and report directly into the computer system and the teams statuses were later seen on a big screen so other could come and help out if a team were behind.

#### **4.3 Employees**

Questions 17 to 22 How do a company motivate and educate its employees and how much time will they have to spend on Lean Production in its daily work?

As said before, all the investigated companies wanted to get more engagement from the employees with the implementation of Lean Production. The focus was that it should be team

based and to focus on team dynamics, right person on the right place.

But the team should not have a fixed team leader, instead should that responsibility be moved around in the team with one month each time. And with more information about the company visions, goals and how the status are in the whole company, make all employees realize the whole picture of the company that their work really counts.

After the implementation all the companies could see three groups of people, one group that understand the concept and were using the tools and techniques, one group that were neutral to it and did not work with it nor did work against it, and one group that were against the new way of working. The tips from the interview companies were to place the focus on the group that are neutral to the concept, win them over and two third of the employees are on, the last group will come later on.

All companies in the investigation do measure their work and improvements they are just calling it different things. The common between the companies are that the employees had had education about the way of measure and been explained why the analysis are going on. Then did the company's focus on different things that were important for their company.

The philosophy was that it is important that everyone has a chance to be involved, even if you choose not to. So no one can come after a change and say that this is not what I would have done. At Pyrotech everyone also has a small area in the company where he or she checks the area, with focus on 5S standards, that everything is in order or if it could be arranged in a different way. This work has made the staff more committed at all companies they said it is a whole different climate. Now is the feeling that the employees are working for the whole company and had notice a greater commitment from everybody's part.

#### **4.4 Results**

Questions 23 to 25. Which benefits could a company gain when changing into Lean Production? The thoughts behind the implementation of Lean Production in these companies were to get everyone more involved and all companies answered that they had succeeded with that. The implementation has also gained a positive process progress in both economical and quality aspect, and also work environment has been better as improvements from the employees and new layout of the factories have been implemented. Both two companies said that the result is hard to measure in money gained but it has had an extreme productive implementation when producing products and that the quality of the products has raced. And again it is important to realise that it takes a lot time in the beginning and the education cost a bit but the companies can now see it as well invested money.

## 5. Conclusion

Lean Production is a production system that was developed by Toyota Motor Company than during the 1950 was over in the USA and visited the large automobile companies in Detroit. Engineers from Toyota felt that it was just in the final assembly line that everything in the line was moving along in a smooth, synchronous pace. Virtually every other stage of the process, parts and materials were produced in discrete large batches. They developed the American way of making automobiles to produce the parts efficiently in small batches in Japan, when they needed it, and synchronized the whole production, not just the final assembly line. Information about the production system started to slip out from Japan during the oil crises in the late 1970 and articles started to be written about this new waste saving way of production. The characteristics of a lean organization are that it is greatly reduced chain of command levels, they are dynamic and highly adaptable to a changing market. The lean production system are summarized under a few fundamental principles that a company could specify value of the manufactured product from the point of view of the customer, with the focus on the value stream for the product and material through the organisation. So the flow of material is smooth running in the manufacturing and assembly workshops where the workers should try to attain a pull production and in every step of the manufacturing the employees should focus on to make perfection. But do not implement lean culture without listen to the organizations own personal, the meaning with lean is not to work harder, with more hazard environment as a result, instead it is developed to work smarter. This thesis has hopefully shown that it is possible to implement a lean production philosophy in every company, but be clear that it has to be developed into the own business in order to obtain perfection.

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