

Investigation of Lean Developments And The Study of Lean Techniques Through Event Studies

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Abstract- *Today the world is very competitive, and is tough enough for anyone to find their place, in today's market, it is quicker now more than ever, demands fluctuate faster and the expectations of the people are higher than ever. They keep moving on, until their needs are fulfilled, this has driven the manufacturing world to act smarter. Manufacturers in today's world need to be sharper and clear about what is to be delivered. It is important for an organization or an enterprise to fulfill the customer's needs, in order to mark their position in this competitive world. Manufacturing world in the present scenario is like a race, and people who are smarter reach their goal. Manufacturing is not good enough due to their lack of knowledge regarding what needs to be done, why it needs to be done and how it needs to be done. According to the survey in 2000, it is noted that 90% of the company's activities do not add value to the company's goal. They all lack one thing in common, that is their lack of clear objectives and strategies to achieve their goals and targets.*

Keywords- Lean developments, low efficient production Feedback system, manufacturing safety

I. MOTIVATION

Manufacturers are usually blindly guided with only one motive, to gain profit; they work just like machines to reach the end having forgotten why they are doing, what they are doing. This is purely because of their lack of involvement. It sounds silly, but it actually makes sense, they tend to not use their brain. The root cause or the underlying problem is lack of proper thinking. Everyone in the company is responsible for their lack of their thinking, and it is not just the top-level management that is responsible for planning but employees of all levels should feel responsible and should involve themselves in any planning and necessary change that needs to be done. Lack of involvement and awareness leads them to produce waste both in information and resources, driving them towards low efficient production, consequentially spending less and gaining more failing to think of the value of what they do, ending up compromising on quality, due to which the cost of product rises. Gradually they fail to gain customer attention and satisfaction.

Manufacturers need to take every precaution in order to ensure their sustenance in the market. Customers switch the manufacturers in case they are not satisfied with the quality of a given product. Rising manufacturers become aware of their competitor's failure, and tend to deliver the quality expected, and gain the customers satisfaction.

II. ASSESSMENT OF CASE

Most problems faced by today's manufacturers are resources, cost, and customer's responsiveness. Most companies in today's world manufacture using conventional means and methods, and hence fail to utilize their resources wisely; this is because they do not implement strategic planning. They face backsliding of their processes to meet its calculated time, lack of on-time supply of raw materials, lack of proper marking system of the supplied materials, lack of on-time delivery failing to identify the root cause of the problem, and taking time to solve these problems, communication barriers, lack of active involvement from all employees, ultimately leading to failed product quality, and eventually losing customer attention.

Most companies usually think they are doing everything in the best possible way, however their ignorance has blinded their sense of perception, while in truth, "failing to produce the right thing, in the right way, at the right time".

In the midst of all these, just imagine one has a magical wand or a tool, that smoothen work flow, levels the work load, optimizes the resources, brings out the hidden problem, and helps us in finding the root cause of the problem identified. A magical wand that brings together all the employees to make them more involved in what they do. Doesn't this sound interesting?

Now let us imagine, there is a company which is very transparent in what they do, implementing changes for betterment no matter small or big, a company whose environment is clean and organized.

“A place for everything and everything in its place”
The materials coming in as and when needed, in the right form at the right place, and in the right quantity. All the machines in perfect condition, periodically maintained. Machines and line assemblies that can adapt to quick change over when needed. A favorable and a Supporting shop flow that signals us when any abnormalities occur in the process, or in the machines. An efficient approach, where the process smoothly flows giving us the information of all the resources used in the flow time to time, indicating the areas to be improved. An organization where in all the processes and activities are metric-driven leading to better output. A company which is standardized bringing together all employees from top to bottom, while enhancing communication between different departments, and motivating each and every single employee to better them at their day-to-day work. A company where in everyone’s way of thinking, extends beyond their routine work, thereby changing their culture. A company that is working at near 100% efficiency, practically perfect in every aspect.

Wouldn’t such a company be every manufacturer’s dream? Yes, it would! Now this dream company is nothing more than a lean company.

Lean is a philosophy which is as simple as it sounds, extracting all waste from the organization making it thin.

“Lean is a systematic approach that eliminates waste, to achieve the targets with a reduced cost”

Lean is not a meteor that suddenly struck the face of this Earth. In fact, it has been used from a long time. Pre-20th century it is believed to have first been successfully been implemented in a textile industry in Japan, and later in the early 21st century became even more popularized, and gained much importance especially in automobile industries, notable names are Toyota and Ford. Now it is at the very least being used as a strategy for companies to sustain in this competitive world. Lean is not just a tool, that has been adapted for a period of time for a given problem, but it is actually as philosophy, a culture, that needs to be followed over a period of time, in order to fully reap its benefits. Lean does not only solve problems pertaining to production, but also to design, product development, administration and every which aspect that needs to be taken care of in order to achieve the goals.

Lean is an approach, a strategy that answers all possible questions, like —What? When? Where? Which? Why? and How?

Doesn’t it make one wonder, as to how such a revolutionary philosophy was kept in the dark for all these

years? As flabbergasted as one maybe, by the ignorance and lack of common Sense, in having not implemented such a simple, yet ground breaking concept, the most significant underlying reason is just as silly, vis-à-vis risk of having to apply something new.

III. OBSERVATIONS

People have gotten so used to the conventional methods, and outdated practices, that they are offended by the very idea of change, moreover, words like lean, tend to scare them, as they consider it is something that will cause a drastic change in the current system of practices, while in truth lean is simply eliminating waste, as the word itself suggests. There is a misconception floating around in their ignorant minds, that bringing in new methods, may involve additional effort or hard work from them, thereby they prefer to stick to their old, outdated, and conventional methods. But the fact is that, lean shows us a way to work smarter and not harder. Lean shows the way to work with ease, by balancing the work load, and by incorporating transparency in their work practices.

Lean is basically — money in the bank — for a manufacturer. Lean is an essential ingredient, without which a company which gradually loses its market value, losing market value is like losing your pride, once gone, u will longer be able to command the same respect as before.

Lean’s objective is basically to eliminate waste, and produce quality products. Note carefully, that lean does not mean reducing waste, it is eliminating waste, for —prevention is always better than cure!

It is evident from various case studies, that lean can be effectively used to practically solve all potential problems a manufacturing may encounter in the course of its existence. The case studies have dealt with diverse problems, while lean has also provided diverse solutions through the usage of various tools, that were carefully chosen according to the state of the problems in the manufacturing company at that time.

“Lean is a journey, not a state.” Lean has to adopted from the very beginning. To become lean, we first need to think lean. We need 2 have the ability to differentiate between what is value and what is waste. We need to understand clearly, as to who we are serving, vis-à-vis our customers. Knowing what the customer demands, is of utmost importance, without which we cannot set goals. While keeping in mind the present scenario, and predicting the future scenario as well, in order to keep track of demand.

Lean is a simplistic idea, which must first be implanted into the mind, and it should evolve along with the individual.

Experts estimated that, 80% of becoming lean has to do with their culture. Change of culture involves changes in their attitude towards work and the ability to, with ease, implement these changes in the work force, keeping intact a harmonious relationship within every level of the organization.

People need to make a commitment to deeply involve themselves into the lean practices, and must foremost believe that lean will in fact bring success, they need to come out of their shell, and dare to start trying out new things, once they start to believe and accept in lean, implementing it over time will become practically effortless. A material change is always more easily accepted by the workers, as opposed to a change in their mind set. For instance, swiping a card as opposed to filling in the attendance, they tend to find it uncustomary, while it is in truth a very effective way of saving time as well as ensuring no mishandling.

Empowering is another key aspect of lean. Empowering the employees, in such a way that, they can take minor decisions by themselves without having to be told by their superiors. Through empowerment of the employees, they start feeling responsible for the success of the company, and hence start contributing even more solely by themselves, resulting in continuous improvement.

Continuous improvement is one of the pillars of lean. Continuous improvement means to constantly strive for betterment and perfection, and not simply eradicating a problem only when it occurs.

In order to bring about change, the first step is to eradicate the assumption that the current system is flawless, and realize that there is a lot of space for improvement. Only through such realization, can they even take the next step, which is actually implementing continuous improvement.

Once such realization occurs, and lean is implemented, it should not be taken for granted that, after these changes, the system is now perfect, instead one must constantly keep realizing that there is always a need for change and betterment, then they will start noting the gradual, yet unbelievable change.

Continuous improvement does not simply involve causing a single major change over a long period of time, but

also involves causing consistent, but small changes over relatively shorter durations.

A single big change may have had a very significant impact on the company, but note carefully that, in continuous improvement, even small changes are not to be neglected, as they also have a very huge impact overall.

Continuous improvement is a gradual process that cannot be achieved simply by the involvement of the top-level management alone, but active participation and involvement from each and every single employee in the company.

Once lean culture is adopted, the lean tools can now be implemented in order to achieve great success. Lean thinking, lean culture and continuous improvement are the heart of lean. If they are all on the right track, lean organizations become clear and transparent of their behavior, and will gain greater understanding of how the various tools can be used.

Internal and external appearances gain transparency only when everything is properly organized, and put in its place, and also looking neat and tidy, following a given standard. This is what 5S explains. Materials are brought in, only when they are needed, thereby reducing the inventory level and storage space, and make the stock levels perfectly clear. This is where just in time comes into play. The suppliers provide the necessary goods and products, on the right time, in the right quantity at the right place, reducing the stress on the employee, providing the goods according to necessity, taking the supplier management by using the same coding system as the internal customer, enhancing the customer-supplier relationship, this is how kanban is used. Effective implementation of all the tools described, will lead to a successful and smooth flow of work, pertaining to the work place, or shop floor or anywhere else these tools can be implemented.

IV. TOTAL PRODUCTIVE MAINTENANCE

The machines are placed in the best possible manner, through 5S, and now they are checked in such a way, that prevention and optimization of break-down and down time of production is made very easy, by a tool called Total Productive Maintenance (TPM). TPM basically Cuts down on maintenance and operation costs and smoothening the productivity in an efficient manner. These machines are designed in such a way, that they are capable of accepting quick changeovers internally and externally, thereby maintaining the flow of production as well as reducing the cost of new machines, which may have to be invested for new

processes. Also, the machines are arranged in such a pattern that favours any sudden changes in any course of a breakdown or down time. The smoothness of the flow is simultaneously checked through signaling systems called Poka-Yoke and Andon, making it clearly visible to the supervisors and top-level management to spot the status of production and the barriers. The quality of a product is checked by poka-yoke by alarming, when a product does not match its standards, or fail to meet its standards, or when it is wrongly assembled or when it fails to meet its metric.

The problem in the process line is signaled by the Andon systems, immediately bringing to notice of the top-level management, or supervisors, depending upon which signal is set off, thereby allowing the problem to be rectified then and there. By these systems the company can be controlled visually, this signaling can help automation to a great extent, giving the employees time to concentrate on other quality related activities. Lean maps all the values on a smooth flow, detailing all the materials, and the information that flow with it. This streaming is termed as Value Stream Mapping (VSM) which plays a major role in effectively implementing lean. VSM differentiates all the Value Added Activities (VA), as well the Non-Value Added Activities (NVA) giving a clear view of the flow, and presenting the bottle-necks and barriers, highlighting the areas of improvement. The value stream is always metric driven. The metrics and the quality controls are the key controllers for all the activities, and indicate whether they are at par with the standards set by the company. These indicators and controllers help the company in identifying the areas of deviation, as well as determining the cause of deviation. The metrics and quality controls are Key Performance Indicators (KPI). The activities and processes of the company are standardized, in order to attain satisfying quality, to meet the customer demand. Another concept of lean, 6-sigma, helps in maintaining the quality of the product by eliminating the variations of the product. It details the flow of process in identifying the underlying and hidden problems through the 5why analysis. Lean makes the flow and the workload balanced, levelling the resources used and scheduling time taking all possible means into consideration.

Lean uses less of a great variety, higher quality and more affordable products in less time. Lean production does not only change the way things are made, but the fate of companies and nations alike, and how we think, work and live.

VI. CONCLUSION

The current updated information on Lean was investigated to explore the underlying concepts and techniques

of Lean Manufacturing and the processes associated with Lean. This study has determined the effects of Lean techniques in various situations or problems in different areas of an organisation.

The importance of the cultural management that plays a basic constituent for the lean survival had been clearly explained. The study has also reported how departments in a Lean organisation operate with respect to the overriding principles of lean. The most powerful tools of lean that drives lean manufacturing has been neatly described with its benefits and the ways to implement it. The effectiveness of the usage of these tools has been studied through various case studies, each dealing with different issues. The case study has brought a detailed understanding of each tool and techniques of lean.

Lean Manufacturing is the best philosophy for any organisation to adapt in this current competitive world in order to consistently endure in their business. Lean is the solution for any kind of problem in an organisation. Lean philosophy will bring the world to another stage where there are no wastes; by continuous optimisation of wastes and usage of fewer resources efficiently.

It is evident from this study that Lean is future for this world. Lean is the philosophy for not only manufacturing but for the engineering management.

VII. PROBLEM RECOMMENDATION

The tool to be used in Lean Manufacturing is not limited to what is discussed above. Depending on the nature and type of the application, an appropriate tool can be used.

The findings of this dissertation have a number of important implications for future practice;

- A further study investigating the Value Stream Mapping could provide an in-depth review of its effectiveness
- Detailed study of each technique will reveal a better understanding of the usage of tools before implementing
- A reasonable approach to tackle this study is to implement these techniques and concepts into manufacturing culture management to enhance a better understanding of the problems and the ability to solve the problems that arise when changes are implemented

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