ANNALS of the ORADEA UNIVERSITY.
Fascicle of Management and Technological Engineering, Volume IX (XIX), 2010, NR2

STEPS OF THE EXECUTION OF THE LEAN PHILOSOPHY

HUSI, Géza* , DIÓSZEGINÉ ZENTAY, Éva**
University of Debrecen, Engineering Faculty
*Electrical Engineering and Mechatronics Department
Department of Management and Enterprise
4028 Debrecen, Ótemető u. 2–4.
*husigeza@mk.unideb.hu **zentayevi@mk.unideb.hu

Key words: Lean, value stream, design, production development

Abstract: The profitability of the production is a significant problem besides the technical problems of the mass production of industrial products. The product satisfies both the material and the quality needs of the customer and provides satisfaction in case the effects of the product perceived by the customer meet their needs. However, the customer is not aware of several manufacturing conditions and is not willing to pay the extra costs, which cannot be directly linked with the productive manufacturing. The article deals with the principles of Lean management.

1. THE REASONS FOR THE LEAN VIEW PRODUCTION DEVELOPMENT

Hungary is pictured as a country of low costs by the European entrepreneurial sector. However, we experience that the companies have found and still find that they need to leave the country and resettle their industrial activity further east on the basis of their cost structure analysis. The direct reason is that the costs levied upon certain companies have increased significantly, companies are exposed to the market effects to a greater extent and competition has grown since Hungary joined the EU. This situation cannot be influenced by the companies, so they need to adjust themselves. The key to this adjustment is the adjustment to customer needs, flexibility, efficiency during production and the ability to react quickly. The customers do not only need a perfect product but they also expect a perfect operation from the companies. This means that value is not only carried by the product itself but likewise the method and the conditions of its production and the use of the environmental resources for the production of the product.

2. THE FIVE PILLARS OF LEAN MANAGEMENT

James P. Womack and Daniel T. Jones defined five pillars to Lean philosophy in the book *Lean Thinking* published in 1996 (James P. Womack Daniel T. Jones, 1996):

- the value creating part of the work must be defined within each process and part of the process; the part, which the customer really pays for or is willing to pay for, that is, what value means for the customer,
- the value creating process elements must be joined to create a continual value stream, that is, the process elements need to be joined, thus creating the value stream;
- the material, resource and information flow shall continually be sustained within this value flow, that is the components, information and people must be ‘streamed’ in accordance with the changes of customer demand;
- production must be developed according to customer demand, that is, it must be taken into consideration how often, what product, in what product range and with what term the customer requires from the company; a pull logistics shall be developed;
- the created processes continually need perfection either little by little or in large scale in order to achieve continual development, the aim of which is to eliminate waste from the processes.

We may select Kaizen or TQM principles for the perfection, though it must be performed constantly. The target is clear: to achieve as large profit as possible.

The fifth element of the development of the business process structure is called the Lean Way. This fifth step may be performed only in case the enterprise is ready to change and wishes to cope with the external and internal customer demand flexibly.
Quality primarily is the consequence of the acts and decisions of senior management rather than the consequence of the acts of the workers according to Deming. The task of the management is the organisation of the system and the management of the general problems, whereas the workers are responsible for those special errors, which are directly caused by their work. Therefore, the task of quality improvement must be shared among the different decision levels. According to Deming, the winner on the market is the one, first satisfying customer demand. Cheap, quick, good quality and appropriate quantity.
This enormous flexibility needs short regulating circles so the modification of the processes conforming to customer demand may be performed in the shortest possible time. As a result, in the Toyota car manufacturing company they monitor the time period between a client placing the order and the time the payment for the car is received. Therefore, the received car is not the only value the customer sees but also the short time spent on its manufacturing. The processes optimised for mass production in order to satisfy customer needs is performed in this case.
This is possible as they are able to modify their processes continually and these modifications are directed by the elimination of waste.
Lean management differentiates seven types of waste:

1. Overproduction: the production of any products or components, which is not based on internal or external customer demand.
2. Inventory: all such stock, which is not directly necessary to satisfy customer demand.
3. Waiting: all the time spent within the production system, when the component does not undergo any formal or character change, or does not change its relative place or position.
4. Extra processing steps: all operations, which the (external or internal) customer did not order, or which are unnecessary for the production of the product.
5. Unnecessary moving of material or product: all material moving processes, which do not deliver the product or the component from one place to another in the shortest time and on the shortest way possible.
6. Unnecessary motion: all such motion, which the worker needs to make during the production process without increasing the value of the product.
7. Defects: all such events, due to which the production or a certain process step of it must be repeated and all such process event, the result of which cannot be delivered to the customer.

3. THE EXECUTION OF THE LEAN PHILOSOPHY

The execution of Lean shall be started from two directions (Kotter, 2007/10). Targets and the changing tasks should be set by the management within the entire value stream. It is important to note that the introduction of Lean shall always be directed by the management and the maintenance of the need for the introduction of Lean is also the task of the management. This is a rather difficult task as it is a paradigm change, the restructuring of the material and information streams, the establishment of a new organisation, which always faces great opposition from the organisation.
At the same time, the development from the direction of the workers means that they need to be informed why the elimination of waste is important, how they can identify them and what they can do against them. It is advised to create special incentive schemes so that the workers would constantly search and report the steps they find unnecessary as the

workers are the ones who are most clearly aware of the actual work. Demand should be raised within them for the better and easier work and they should be made familiar with the concept of the internal customer as well as the role they can play as internal customers.
The introduction of Lean is not difficult, their tools are not difficult either; it is based on simple calculations, analyses. However, the introduction is usually rather difficult in practice. The already introduced cultural embeddedness and the human factor are both important elements of the difficulty as the workers need training, they need to be involved in the changes, they need to be convinced that these changes are inevitable and carry new attitude. On the other hand, the introduction itself as project management carries difficulties as well. A project has a beginning and an end, it has fixed costs, time frames, so at the end it can clearly be stated whether the project was successful or not, whether it reached the targeted objectives. Independent on the product produced during the manufacturing process the management needs to face the following problems:

- The problem of the inventories and the changes of stock.
- Warehousing problems deriving from the large quantities of the semi-finished products on the manufacturing area.
- Unfeasibly placed warehouses, which require great extent of moving.
- Bad relationship among maintenance and machine operators.
- Dirty, disordered work stations.
- Long switching, resettling times.
- Manufacturing phases independent on one another, bad information flow.
- Reactive maintenance, lack of the use of diagnostic tools.
- Opposition of the maintenance and the machine operators.
- Incidental work accidents.
- Number of waste and its increase.
- Persons appointed are responsible for quality.
- Customer, buyer complaints.
- High level of operating costs.

The company can expect the following results if they introduce Lean management:

- The decrease of the customer complaints due to faulty products.
- Decreasing manufacturing costs.
- Production flexibly adjusting to the changes of the market.
- Drastic decrease, feasibility of the stocks.
- The decrease of the stock of the material, assets and capital tied up in the manufacturing processes.
- The optimisation of the scheduling of the material and product waiting and manufacturing processes before, during and after production.
- The termination of the unnecessary material moving
- The minimisation of the quantity of the tasks not creating value
- The termination of the unnecessary paper creation
- Better organised, cleaner and more ergonomic working environment
- The termination of overproduction with regard to interim and final products.
- The termination of the faulty final products and the further processing of the faulty interim products.
- Working areas freed within the factory
- Good utilisation of labour force
- Better working morale

4. CONCLUSION

Lean production has grown into one of the trendiest and most promising company management system restructuring the entire company performance. Its aim is that the company should produce its products and services for its internal and external customers most efficiently. The lean company primarily manages its business activity on the basis of what serves the production of the value for the customer. The lean, the most significant element of which is continual development, is also undergoing changes as new thoughts, tools and methods are evolving nowadays as well reaching service providing companies, the public and the health sector as well after manufacturing companies (partially due to the economic crisis of 2009) in order to increase customer satisfaction and to create more and more efficient operation.

5. BIBLIOGRAPHY:

[1]James P. Womack Daniel T. Jones . (1996). *Lean Thinking.* New York: Simon and Schuster.
[2]James P. Womack, Daniel J., Daniel R.. (1990). *The Machine That Changed the World.* Rawson
[3]Kesztler, R. (2007). *leandesign.hu.* Letöltés dátuma: 2007. 12 28, forrás: 100 lépés a lean világába: http://leandesign.hu/content/view/25/39/
[4]Kotter, E. (2007/10). A Lean utján haladva. *Magyar minőség* , 2.
[5]Petrók, J. (2007 1-2). A Toyota Way. *A jövő járműje 2007.* , 10.
[6]Sekine, K. (1999). *Cellular Manufacturing Learning Package.* Andover, HantsUK: Productivity Press.
[7]Sipos I. Husi G..(2007). Az emberi tényezők szerepének meghatározása a légijárművek karbantartásának minőségbiztosításában . *Debreceni Műszaki Közlemények 2007/1 ,HU ISSN 1587 – 9801* , 45.
[8]Szekernyés, Z. (2007/8-9). Új szemléletmód - LEAN manufacturing a National Instrumentsnél (NI). *Magyar minőség* ,
[9]Tóth, C. L. (2007/8-9). A Karcsúsított gyártás -A Lean Production A Lean, ahogy én látom. *Magyar minőség* ,