

Detection of the necessary characteristics in a Lean leader to achieve the success in the implantation of the Lean methodology

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1. Introduction

In the present paper, the work developed throughout several years carrying out implantations of Lean Manufacturing (Cuatrecasas, 2005; Womack and Jones, 1997) in different environments is presented. From the above mentioned implantations, we have obtained which are the necessary characteristics in a Lean leader with the purpose of reaching the success in the above mentioned implantations. We will see that though the habitual characteristics are needed in all the leaders, these are not sufficient to guarantee the success in the Lean implantations. Specific characteristics in the Lean environment are required.

In the work the carried out implantations are emphasized, although the characteristics needed by the Lean leader are highlighted in order that the implantations do not fail (Asao, 1994; Tapping, Luyster, Shuker, 2001). Specifically, two implantations of the philosophy Lean are analyzed. The first was carried out in an assembly line of an industrial company of the electrical sector, and the second took place in the assembly line of electrical engines of a car components company. Both are multinational companies, one of them supply first line products and the other supply components for the best world companies.

2. Detection of Lean leader characteristics from practical cases

First, we proceeded to audit the current situation of the company and its production lines, establishing a Lean Manufacturing strategic action plan. For the diagnosis of the current company condition, as well as the evaluation of the Lean project implantation impact, different metrics were used (Hirano, 2001; Jackson and Jones, 1996; Suzaki, 2000; Tapping, Luyster y Shuker, 2001).

From the obtained results in the audits, which corroborate that the organization situation is not the wished one, we proceed to fit the production to the client demand, controlling the materials inventories and its flow, optimizing the space of the company and implementing a work methodology based on constant improvement (Monden, 1987; Ohno, 1991; Prado 2000). It is precisely across this process of Lean philosophy implantation, when we have analyzed which are the necessary characteristics of the Lean leader, which assure the implantation success.

3. Implantation of the Lean philosophy in an assembly line of an industrial company of the electrical sector

In this case, the implantation of Lean Manufacturing was developed in an assembly line of a multinational company which supplies first line products of electrical distribution and control. In the plant, which consists of a zone of load and unload, a storage zone, production lines, and offices, the processes carried out are: injection of thermoplastic, assembly, winding, presses, riveting, pad printing and impression laser.

As in all the implantations, first one proceeded to audit the current situation of the plant, establishing later a Lean Manufacturing strategic plan of action. The audit reflected inventories of two million euros, a rate of service of eighty five per cent and a value of the not served orders fewer than one hundred thousand euros, when the ideal desirable values were a inventory of one and half million of euros, a rate of service superior to ninety per cent and an amount of the not served orders lower than hundred thousand euros. The audit allowed verifying that the situation was not the wished one. Then, the company proceeded to implement the Lean philosophy, fitting the production to the demand of the client (Scholl, 1995), controlling inventories, optimizing space and implementing a methodology of work based on the constant improvement (Bounine, Suzaki, 1989; Cuatrecasas, 2006; Galgano, 2001; Womack, Daniel, 2007), the order and the discipline, using tools as the five S (I Equip of Productivity Press's Development, 2001; Hirano, 1997), smed (Shingo, 1992), the visual control (Shimbun, 1991), distributions in U-shaped plant (Hirano, 1992), and plans of formation, between others.

The leader of the implantation was entrusted with, between others, the task of expiring with the rules that habitually apply the organizations that are successful in the Lean production: to design, to construct and to maintain a weave of cooperative human relations; to design a system that allows the workers to improve constantly their technical capacities and solution of problems; as well as the systematic improvement of the quality, cost, speed and flexibility of all the organization processes. One of its main targets consisted of integrating these three factors and reinforcing them in the appropriate direction.

For it, having present that the essence of Lean Manufacturing takes root in the skill to learn of the existing information flow of the company with the purpose of improving the process, and that this resides in the persons and not in the machines and equipments, great support in the implication of the leader in the multidisciplinary groups of work was done, where the members contribute with their knowledge and learn to improve of constant form and with zero cost for the company.

The leader proceeded between his first activities, to develop a formation adapted to the personnel, and to facilitate that this one was committed with the changes to develop. For it, he started a formation plan of the human team involved in the transformation of the productive system, based on visits to other plants of the group and in seminars of very short duration. On the other hand, he developed a project in a small area, which allowed him to demonstrate to the team collaborators, the validity of the results as much for the company as for the own workers. With that, the leader could guarantee his leadership and extend the Lean philosophy to other areas of the plant, with more collaboration of the workers. This technique of showing the efficiency of the Lean philosophy to the workers across small improvements or small projects is very useful at the moment of carrying out Lean implantations, at the time that it facilitates the consolidation of the figure of the leader.

Other important labors developed by the leader were the joint presentation to the direction of the company, intermediate managers, as well as to the personnel of the team, the reached improvements. This presentation became a recognition of the direction of the company to the

team. Following the Lean philosophy, they also proceeded to construct a panel with the photos of the team members, together with the studies carried out, presenting the situation before the improvement and later, with the purpose of announcing to the rest of the personnel the reached results and the benefits for the company, and what is much more important, their own benefits on having worked more effectively and with major safety.

The Lean direction needs a cultural system of organizational growth, although a deep comprehension of the way in which the persons work in teams and a new attitude towards the intelligence and the creativity, which requests a proper leadership style.

The reached profits with the implantation were between others, a major utilization of the space, improvements in the managing of the materials, increase of the flexibility, elimination of unnecessary elements, reduction of the times of change, consolidation of a structure that foments and supports the improvements, improvement of the flow value depending on the demand of the client. The obtained results are reflected quantitatively in the following table.

Table 1. Statement of results reached in the implantation with the used metrics

	Before	Later	
Value of the not served orders	15.000 euros	200 euros	- 99 %
Time of cycle	140 seconds	100 seconds	- 29 %
Inventory	35.900 euros	4.800 euros	- 87 %
Workers for shift	7 workers	5 workers	- 29 %
Occupied space	30 m ²	20 m ²	- 33 %
Units for worker	120 units	230 units	+ 92 %
Rate of faults	5.200 ppm	600 ppm	- 89 %

All this has been possible thanks to the reduction of the unnecessary times and the optimization of the work of the workers looking for the global standardization, every time the style of leadership required in a Lean implantation has facilitated that the figure of the leader is able to involve the workers in the improvements.

The human capital is very important in the creation of value, what it requires as well a leader with specific characteristics that facilitate the implantation, because the implantation of the Lean philosophy needs deep cultural changes in the organization. The above mentioned characteristics remain reflected in the conclusions.

4. Implantation of the Lean philosophy in the assembly line of electrical engines of a car components company

It was a semiautomatic line of assembly of electrical engines of direct current, employees in the ventilator of the cars refrigeration module, in which the transport of the components was realized across pallets circulating along a flexible line. The clients are the principal car companies worldwide, with a staff that overcomes the hundred of workers.

Once reached the commitment with the philosophy of the Lean production, it was come to audit the current situation across a flow analysis, being detected that the installation was old, slightly flexible, with few capacity, high inventories and occupying a lot of space. Before it, it was come to the implantation of the Lean philosophy, naming the leader of the implementation. In accordance with studying the reaction of the workers against the leader attitude, we obtained the conclusions presented in this paper, based on the characteristics that must be the Lean leader to reach the success of the implantation.

Steps developed in this implantation with the purpose of organizing the line as well as the flow of the materials, increasing the capacity, the productivity, improving the performance of

the installation and reducing the lead steal were: detection of the operations that do not add value across the flow value analysis (Tapping, Luyster, Shuker, 2001), division of the work area in zones with the purpose of clarifying the flow of the pieces (client - supplier), and making responsible every worker of his zone; implantation of the stuck-up flow, making exclusively what the client asks, with the purpose of reducing the inventories as well as the delivery time. For the implantation of the stuck-up flow one proceeded to automate the expulsion of pieces, work with small containers, use visual control systems (Shimbun, 1991), specially for inventories, to supply the lines of regular and productive form, implantation of the information system Kanban, etc. The income statement obtained with the Lean Manufacturing implantation appears in the following table.

Table 2. Income statement of the implantation of the Lean philosophy

	Before	Later	
Rate of return client	5.000 ppm	250 ppm	- 95 %
Rate of internal rejection	25.000 ppm	2.500 ppm	- 90 %
Performance of the process	62 %	89 %	+ 43 %
Efficiency	78 %	92 %	+ 18 %
Time of change of reference	27 minutes	0,5 minutes	- 98 %
Last accident	350 days	462 days	+ 32 %
Ideas of improvement	3 ideas/year	15 ideas/year	+ 400 %

The company passed of a practically obsolete, slightly flexible installation, with little capacity and occupying a lot of space, to a completely renewed, very flexible installation, with more capacity, and reducing the surface occupied in more than sixty per cent.

The difficulties of the leader to implant the Lean philosophy are concentrated basically on the strong reticence on the part of the workers to the change, to the implantation of new philosophies of work, motivated habitually for the time that they take working and believing that it is the best method. Before this situation one came from analogous form as the trainers who act with courage to change the position of the player star and in addition to convince him that it is the best thing for all. The movement of a star player corresponds with the rotation of positions of the veteran workers. The experienced workers are dominated by the inertia, thinking that the best way of doing the things is "the way as they have been done always". To avoid these problems the Lean leader read has to do rotations. In the absence of some persons it is possible to stimulate some "fresh perspectives", which promotes the best procedures. In the analyzed company, the temporary fall of a veteran worker with a back injury, one took advantage to design a working place dedicated to the assembly of a few subsets necessary for the line of production. When the worker joined the company, he was located in a working station ergonomically studied and technically prepared (only with the strictly necessary thing), for the assembly of the mentioned subsets, but isolated from the line of production.

In case of new personnel, the Lean leader has to have the aptitude to stimulate them, continuing with the analogy of the trainer, he would say to them "if you lost it is my fault, which I need that you do the best thing that you could". This means that it is necessary to define aims for the new personnel, later teach the methods to them and say to them exactly: "do the best you can".

Everything exposed demands a positive response of the leader, who will have to convince, to teach to the workers that the new philosophy reports big benefits to them and to the company, which needs a leader's profile that it is exposed in the following paragraph.

5. Conclusions

The successful organizations with Lean production chase three aims that join and reinforce mutually in the appropriate direction:

- To support and take care of human cooperative relations.
- To improve constantly the technical and of problems resolution capacities of the personnel.
- To improve the quality, the cost, the speed and the flexibility in all the processes.

The essence of Lean Manufacturing is a wide flow of information in the company and the skill to learn from this information to improve the process, which reside in the persons and not in the machines. That is why Lean technology implantation is based on the personnel implication by working on multidisciplinary groups, in which members compromise themselves with change, contribute with their knowledge and learn to improve constantly.

All this leads that Lean management is based on a cultural system of organizational growth and on a deep comprehension of the way that persons work together, simultaneously with a new attitude towards the intelligence and the creativity. Lean management is a conceived system to develop and manage equipments of responsible persons, trained and motivated, in another words, a culture, because besides defining an opened and cooperative communication style, deliberation and action, it considers an essential element of the human activity: quantitative improvement jumps, in another words, growth. In this context, the figure of the team leader plays a so important role, that diverse analysts believe that the difference between a successful organization and other without success is precisely the leadership. Across our works, we have formed a profile for the Lean leader.

Each Lean leader must have charisma (term proceeding from the Greek which means "grace"), and must possess:

- **Intelligence.** The person should be intellectually brilliant and professionally competent. Provided that there will appear simultaneous problems, he must act as a player of simultaneous chess games, because he will have to decide without having time. We estimate that 50 % of the activities should occupy him less than 10 minutes of reflection.
- **Confidence in itself.** To believe in his own aptitude to implant the lean tools. The Lean leader has to have a high self-esteem and a moral of permanent victory.
- **Will of not letting itself frighten by the circumstances, to make possible what it seems to be impossible,** having a good capacity of emotional self-control. Obviously this is obtained knowing the trade and possessing the capacity and the skill of solving a difficult problem under a creative and innovative optics. The Lean leader at first is a manager of anomalies, in the beginning of the system implantation he solve problems and crisis situations, acting in this phase as the monitor of the group.
- **Knowledge of the team.** To know how much effort can obtain from the members of his team, with whom he will have to support a narrow, personal contact, mutual confidence, as well as availability to explain the actions, to listen and to foment the participation that means, establishing an active and bidirectional exchange with the team. In this point there must be highlighted the relevancy of the capacities of interpersonal relation. Approximately, between 80 and 90 % of the time he is speaking with the others, and these relations have a marked informal character.

- **Communicator's Skills.** The leader can express in attainable terms, mobilizing the team members to reaching ambitious goals. He must show capacities of good negotiator and he must be able to act of speaker (explaining always what he does).
- **Ability to wake up the pride of the team members and to elevate their expectations,** which generates an impulse of overcoming and to obtain what it seemed impossible, thus reaching, a greater motivation to the service of the objectives draw up. The Lean leader presents a good group sense that acts like a coalescer wakes up the necessity of belong to the group, transmits passion, illusion and energy of permanently, for this, the dedication to the professional work as far as amount and rate very has to be lifted.
- Not to doubt the value than is going away to do nor of the viability of its execution, all is know that generally the great leaders are products of the great causes.

Though, the leader efficiency not depends exclusively on his individual characteristics, but in addition it depends on the nature of the expected situations, as well as the characteristics and needs of the team members.

Since the direction implies not only leadership but also responsibility on results, the search of the style of effective management the more of the leader considers, in different situations. For it, we distinguished between:

- **Relations between the leader and the group.** Confidence of a group in their leader, how arranged is to follow their indications, as well as the affection that they profess to him. When greater it is the relation between the leader and the group, less necessary turns out the power or special a hierarchic level from the leader to reach its objectives.
- **Structure of the task.** The existence of structured tasks facilitates the coherence, the image of authenticity and the influence of leadership.
- **Power of the position.** The task of the leader is easier whatever firmer and intense their power position is.

The development followed in the lean implantation has complemented with the theory of the path goal, which describes the leader as the responsible for the increase of the number and type of interpersonal relations between the team members, who drive to manage the aims and to facilitate these relations, clarifying the ways towards the goal, in our case the elimination of the waste, reducing the difficulties and increasing the opportunities.

Without the skills of the leader here outlined there had not been reached the results waited in the developed implantations. Problems as the workers age, interpersonal relations, confidence in their selves, reticence to the change (Japanese Association of Human Relations, 1997), etc., need characteristics of the leader that they allow to do them. Not uselessly, already the famous Maquiavelo described the reticence to the change: "there is nothing more difficult of planning, not more dangerous to manage, not less probable of being successful, that the creation of a new way of doing the things. Since the reformer has big enemies in all those who would benefit from the old thing and only a lukewarm support from those who will win with the new thing".

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