

Monitoring the implementation of Lean Manufacturing in a strategic area of an international company of IT

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Abstract

The objective of this study was to analyze the evolution of several management and monitoring practices in order to search for a better Lean Manufacturing implementation process in an IT company. The focus of the search for best implementation practices by companies, and the search for results in leaner structures, acting as global standards. In this dynamic context, the methodology adopted It was through an exploratory and qualitative research, which was carried out several surveys with 13 components of the group's strategy Company. Seeing the implementations, the biggest challenge was to show all points was positive.

Keywords: Implementation, Lean manufacturing, IT company, strategic.

1 - INTRODUCTION

The development of enterprises brought the fragmentation and the search for continuous improvement has been growing, increasingly due to practices carried out throughout the world. With the growing trend of administrative procedures that observed in literature, we can see the great interest in the best practices for the evolution of management.

This analysis of evolution points out also, the growing analysis done by several practices of administrators to find indicators that measure the evolution of this type of management, which seeks a better analysis of the fragmented execution implementation of the same knowledge. As consequence there are other tendencies of the administration which corresponds to the perfect interaction between the different administrative systems of enterprises, especially when these systems present global scope for the company as strategic planning, total marketing productivity and re-engineering.

The main reason for the constant search for better implementations by the enterprises, and the search for results in leaner structures, acting as global standards.

In this dynamic context, the provocative new administration ideas are a reality where the administration starts to focus on the individual, and on the commitment of people towards the company's results. And thus, the great concern is to establish levels of priority within the own administrative segments.

Changes in decentralization processes of knowledge, benefits the practices on the management processes, particularly changing the ways of managing people at their work environments and changing the ways previously created for work. In this analysis, it will be focused the implementation of the concept of re-engineering in an area of strategy with focus on training, career analysis and review to welcome new professionals in an enterprise service oriented on technology.

Thinking about the growing market of professionals focused on technology, it was created in 2005 the Training Center (TC), where the main action would be the training for development of specialists who would work on problems of clients of the company in question. In 2009, the joining of the training center with areas that were involved in careers and with the evaluation of new professionals in Company A, was done and with that, a group with 13 people that exclusively target resources training strategy known as RTS was created.

Due to the large recruitment of new professionals (average of 70 features per month) was necessary to adopt a re-engineering process that could redefine the activity and improve the delivery of the final product (strategy per person). And with this process can be observed the need for constant improvement, because previously, the activities were not so relevant according to their performance or even its importance, combining simple with complex activities, without observing the degree of urgency that each one should follow. A large and important decision-making, adopting a methodology that was capable of being implemented and in a short period of 7 weeks already begins the analysis of the generated results.

An observed tendency and large worry that was given to the importance levels seen between the systematic decomposition of systems with the processes of customer relationships. Naturally at a certain point, these decomposed parts are linked to a structured and logical way searching improvement in matter of business, aiming the optimization and improvement of the processes.

In this article it will be presented the opportunities that may be achieved by monitoring the implementation of Lean Manufacturing in a strategic area of an International Company for Information Technology. It aims to identify points of failure in the process, determining the time spent on tasks and designing the increased productivity that will be achieved after the

implementation of Lean, you should check if there was a decrease in costs with the implementation and examine whether there has been increased customer satisfaction.

Identifying the failure points and suggest solutions to help with the implementation of Lean, always searching for continuous improvement to the area in question, checking whether the Lean Manufacturing after implementation maintains the quality of the service formerly provided or not. The methodology adopted for this article and qualitative research, given by the difficulty faced to find studies related to apply for the concept of reengineering in a strategic area of the company. The data collection was done through the activities in-depth survey conducted with 13 members of the area, where it was created a questionnaire that was filled in by each member, placing its activities performed in a month, the time of each activity performed in the same period and the level of complexity considered for each reported activity.

As consequence the constant search for improvements, generated by measurement indicators, where the measurement should be a result of the strategy of the organization covering the main processes and their results as mentioned by Tachizawa and Faria (2008). Since the information generated through research can be analyzed and put into practice, lowering in 15% the working time with the same charge of activities previously carried out.

2. THEORETICAL MODEL

The basic consideration for the purpose for the adjustment of enterprises or areas in patterns of re-engineering, and radical restructuring of processes aimed at achieving improvements established, and the creation of indicators that can be used to measure the performance of its structure.

The implementation of re-engineering in an area of strategy, due to the fact of the following reasons:

- Changing market
- Entry to new markets
- Adequacy of market tendencies
- Innovation

It is noticeable that many researchers demonstrate the excessive emphasis given to the relentless search to produce physical goods and service availability as a factor that would solve all social and financial companies' problems. However, for organizations to be succeeded through their function, production or especially service, the focus of the study, it is necessary

that the environment that permeates learning the organization is effective and efficient. It comes up the necessity for organizations to acquire and manage learning skills, especially how to measure the relational behavioral competence, which will a challenge be for companies (Pozo, 2021).

Re-engineering may be considered an evolution itself, as can be seen in the use of standardization in 60s to 90s when the focus was no longer represented by methods and came to be represented by systems.

Combining the use of techniques of administration with the technology, the transformation processes in the companies became faster, in order to make them competitive

According to Maximiniano (2006), the Toyota Production System was developed through the techniques of Henry Ford and Frederick Taylor. This system was created by Eiji Toyoda, from the family owner of Toyota and Taiichi Ohno chief engineer of the company. It was made an abridged version and improved the ideas and techniques that were developed by the pioneers of the administration. However, the Toyota system is just another stage in the history of the techniques that were invented to improve production systems.

The basic principles of Toyota model are:

1. Waste disposal.
2. Manufacturing with quality.

The principle of waste elimination, when applied to the factory came up to lean (Lean Production), which consists of manufacturing with maximum economy of resources. This principle has been used, especially in recent months due to international financial crisis that has been installed.

The principle of manufacturing quality aims to produce virtually without defects, which is also a way to eliminate waste because rework is considered a big production waste of time and cost.

The two principles together allowed Toyota to produce the highest quality and most competitive prices. Toyota turned out to no longer be a small company, insignificant to the world's third automaker position behind General Motors and Ford. Although we are facing a crisis, Toyota sales have not decreased, but remained while sales of Ford and GM declined.

The third element that contributes to the success of the system includes employee participation in decision processing. The figure 1 represents the three main elements of the Toyota production system.

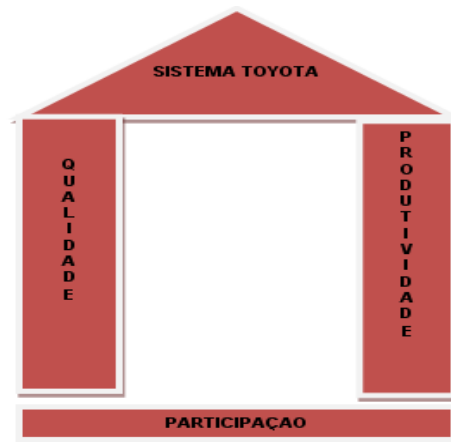


Figure 1: Elements of the Toyota Production System
Source: Maximiniano, 2006, p. 187.

2.1. Qualification of the reported problem

As the technical competencies of knowledge, skills and attitudes, we can see two competencies (knowledge and skill), are considered as technical skills. Where technical skills are characterized by practical and theoretical knowledge, expressing attitudes and behaviors that influence the results generated for employees.

According to Leme (2005), behavioral competence and all that is needed to be shown as competitive, causing major impacts on their results generated have the technical competence and what the professional needs to know to perform well their activity or function in the company. It is analyzing the performance of the companies; these competencies must be identified as a major challenge because it can't be easily proved.

This way the professional service should possess three elements: knowledge, skill and attitude. A good service provider in any technology company must strictly follow the standards of the CHA, which should have great product and customer knowledge, strong agility in the process of customer service attitude and motivation and initiative to generate new solutions client-oriented.

Zarifian (2003) demonstrates a problem that the study area indicates where the technology professional knowledge must not only concern with technical issues but also to globalized problem behaviors, visualizing characteristics of its customers and always trying to have a view of professional growth. These characteristics achieve the results required by the company and customer satisfaction

It's necessary to mention Fleury and Fleury (2001), who describes the position of the globalized world, the competencies that are emerging should adequately processes for different kinds of situations always improving the delivery to its customer.

According to what it was said above, the study area has brought high costs to the delivery of services, and it is being charged from the delivery of the same kind of service, with the same quality with lower prices to be transferred. Furthermore, the arrival of employees in large quantities requires adjustment more quickly to their development and improvement of strategy, where they must comply with delivery period and reduced 96% cases of successfully exploiting it.

It's possible to see that:

- Some processes must be streamlined and expedited so that the customer is served in the shortest time possible.
- Rework, that generates increased costs and causes a decreased productivity, can be reduced to zero.
- It must increase productivity.
- It should deliver what the customer hire and eliminate what does not add vale.
- It should achieve the standardization of services.

According to Campos (2007) Lean, or lean manufacturing, is a system designed to deliver customer products and services with no errors in the shortest possible time, with less effort, resources, space and capital.

Based on the analysis it is clear to state that the deployment of Lean, will be very beneficial and will bring good results. There will be increased customer satisfaction and costs will be lower, which will provide increased profitability.

The specific goals of Lean are:

- Analyzing the problematic situation in a more detailed way.
- Deepen the understanding of the requests.
- Monitoring the implementation of Lean.

4. METHODOLOGY

This study was written through an exploratory and qualitative research, which was performed several surveys with 13 components of the group's strategy Company A, willing to discover the opinion of each member on the implementation in question. This kind of research is presented as technical procedures and in most cases by library research or studies of case.

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The choice of using of the qualitative exploratory research, is the great possibility of perception of the public interviewed, aiming to be deeper in some points that was not aware of the area itself so far, because it deals with it where the knowledge is the employees' minds.

A strategy area (RTS) owned by the Company A was chosen to examine the concepts of re-engineering because we're dealing with a unique event, whereas Eisenhardt and Graebner (2007), the greatest challenge was in selecting cases and in this article, the case took place because of the importance of being implemented in an area of strategy and not an operational area, which the model is based on.

5. ANALYSIS

It was created the strategy area in Company A, looking forward to watching the professionals' career, guiding them to a specific training, working with the professional growth in its own structure, and mainly working on projects related to the growth of own company, in which the number of working abilities of new hires for the current year.

The decentralized growth of the strategy structure was necessary to implement the re-engineering process, where the Lean process was adopted. Thus, several explicit information had to be highlighted so that they were tacitly considered the number of requests that the group received versus the number of hours each member worked.

With this analysis, it was possible to identify problematic factors, where there were more than one person performing the work, and mainly, it was possible to identify the amount of wasted time that existed between one task and another, thus creating customer and some employees of own area dissatisfaction.

The re-engineering process was adapted to standards previously adapted to operational areas, not to a strategic area. The studied group is composed of 13 people, but due to the amount of overtime performed the number of resources grows to 15 performing 370 requests per month, with an average of 26 requests per month strategy by each employee.

In the analysis, after manual research, related sub-activities, times and amount of performed activities per month of each employee, which can be analyzed after being used standard levers of improvement, the group may have a better performance with 15 % less in the group, representing less two professionals, and reaching a goal of 13 features as designed for the service structure.

The figure 2 below representing the application of levers is a result of studying and targeting activities within the group, creating a picture of a responsible person for identifying the incoming requests and distributes them according to the level of complexity of each activity, this new function was defined as a distributor of activities care and especially the use and creation of standardized documents for the receipt of new strategies, creating uniformity and standardization of all the points to be attended by the group in question.

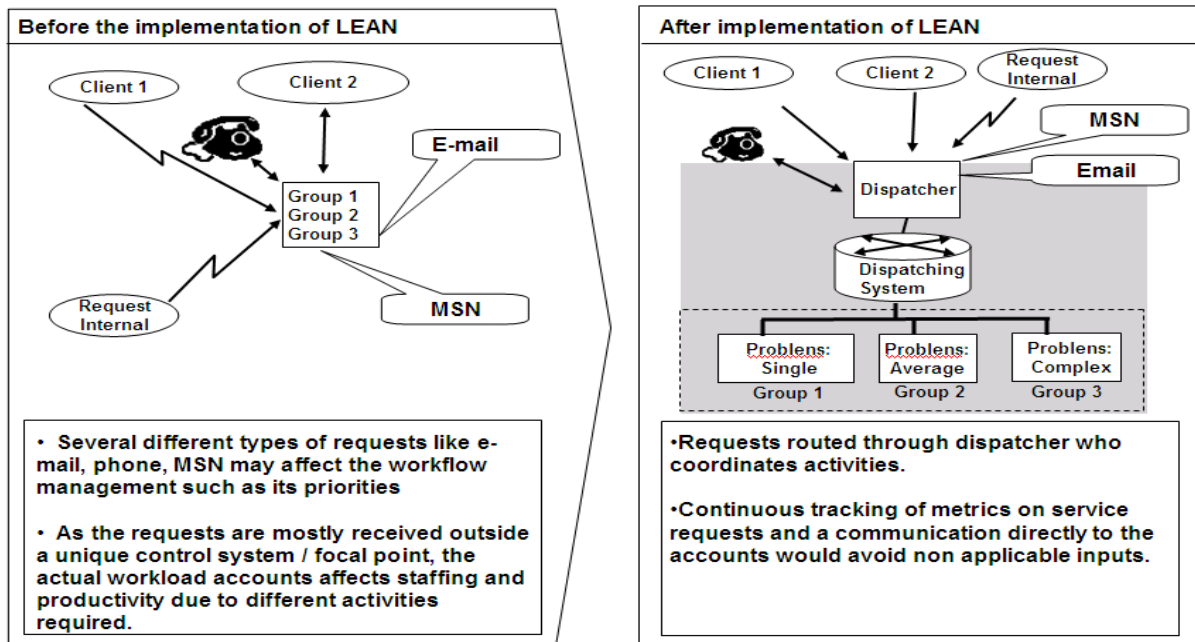


Figure 2: Distribution of activity within the group.

Source: Created by the author

Another important factor, that was analyzed, was the distribution of the group, so that they could have greater integration and reduced time lost due to communication problems, structure, previously located in different buildings, is now consolidated in a single unit avoiding rework and mostly avoiding problems of internal communication.

After creating the mapping of the most critical processes executed by area, can be observed control points, where there are problems to be solved, which were previously unnoticed, for not having a formal layout of the participants in this process. Creating performance factors for which it was resolved. For all the activities generated by the group were analyzed, a search was done, where again the monthly activity launch was evidenced after the consolidation of all group members, resulting the analysis below, that really the area of strategy, executes large numbers of level requests according to the to the figures below division, figure 3 - of activity by complex (Simple). , figure 4: Distribution of activity by complex (Average) and figure 5: Distribution of activity by complex (Complex).

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A Simple		12% Time
Activity	Volum	Time
Provide results	64	15360
Certified list	14	1680
Update data	3	1080
CV (resume) database update	4	360
Students database update	4	360
Update Certifications	1	180
Trainings invite	2	120
Intranet (wiki) update	1	60

Figure 3: Distribution of activity by complex (Simple)
 Source: Created by the author

The figure 4, next, show the distribution of activity by complex (Average). and figure 5: Distribution of activity by complex (Complex).

B Average		23% Time
Activity	Volum	Time
Career Training Execution	6	12000
Transportation based on request	36	10800
Document Courses in a catalogue format	11	3960
Up skilling Program	12	2160
CV triage	4	1920
Transportation based on demand	5	1800
Administration and generate tools reports	7	840
Documentation update regarding institutional partnership	4	360
Meeting report	4	360
Creation Certifications reports	3	270
Internal certification / career management support	2	180
Support and generate tools reports	1	180
Certifications support	1	120
Intern plan, definition and execution of trainings for Projects Transition	1	120
Opportunities explanation	10	100

Figure 4: Distribution of activity by complex (Average)
 Source: Created by the author

The figure 5, show the distribution of activity by complex (Complex).



C	Complex	65% Time		Activity	Volum	Time
		Volum	Time			
				Training Plan into External Education Institution	2	480
				Alignment with RM team (trainings)	5	450
				Institutional lecture measurement	2	360
				Student class closure	2	360
				Lab infrastructure management	2	240
				New hire triage	2	240
				Replicators management	2	240
				Strategy alignment	2	240
				Training closure	2	240
				Internal Capacity management	2	180
				Internal capacity support	2	180
				Internal training management	2	180
				Internal trainings development	2	180
				New partner opportunities disclosure	2	180
				Expose new opportunities to External Education Institution	8	160
				Control market (Education Institution) opportunities disclosure	3	135
				Education Institution arrangement meetings	3	120
				Special Projects Planning and Execution	13	46800
				Capacity analysis	9	16200
				Courses Plan for Service Line	23	11040
				Upskilling Plan - Intern	18	8640
				Course creation to Service Line	15	3600
				Course execution for Service Line	11	1980
				Non-support for Tools	10	1200
				Course creation general for all Groups	2	720
				Education Institution Meeting attendance	4	720
				New partnership visits	2	720
				Qualify and register all replicators X Service Line X Knowledge	2	720
				Development of new resources to clients	2	480
				Support for client Tools	2	480
				Institutional Lecture	2	480
				Meetings with Governmental Entities	2	480
				Meetings with managers to define the training needs	4	480
				New partnership development	2	480

Figure 5: Distribution of activity by complex (Simple)
 Source: Created by the author

The analysis generated due to the complexity of activities, it's possible to achieve the data below, where according to Carreira (2004), the measurements generated by implementing ementing Lean demonstrates clearly which location should be examined, or even what the process with higher level of rework, and generates quality meters eliminating wastes

There are two measures that are easily understood through the analysis, as demonstrated in Figure 6, analysis of activity time, and the analysis by number of requests, whereas Feld (2001) the use of levers to drive improvement, and the creation of efficiency meters, eliminate waste and improve the level of each category of activities

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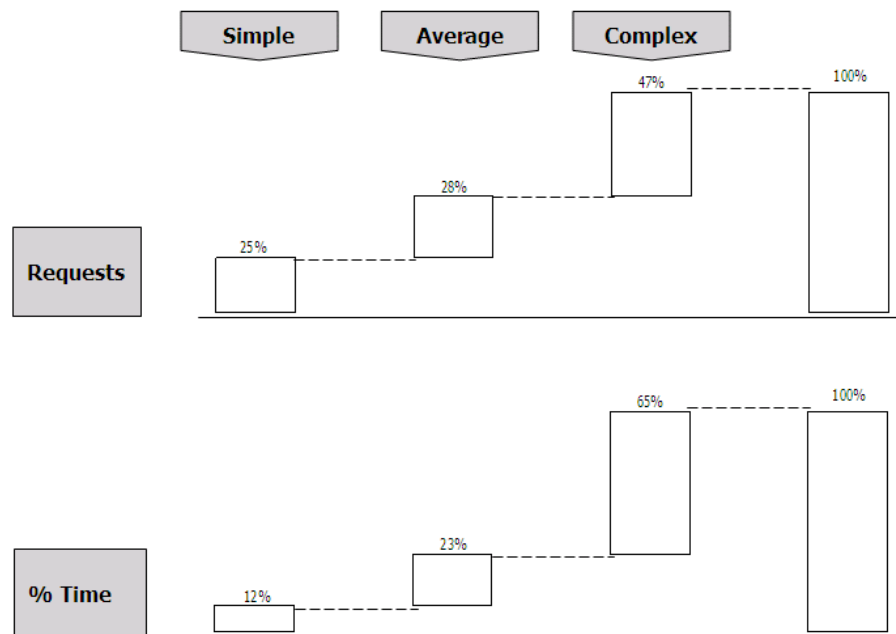


Figure 6. Analysis of requests review of time per activity
Source: Created by the author

As the research developed through manual search, the area in question performs three different levels of activities, which were simple, medium and complex. With this analysis, a division by targeting the team because of the complexity of activities did not cause any impact and as the area has different types of profiles and different types of knowledge. The division by levels of complexity did not cause any impact but, generated a gain in productivity with this division and can continue working with the characteristics of the professionals with their respective activities.

It was also observed that the gain in productivity obtained with the division of tasks. This facilitated the interaction between the members of the team, and especially increasing the level of knowledge in certain activities. Was created a new expertise, which did not exist until then where all people were generalists in their duties.

The figure 6 represents strongly the division that occurred within an area of strategy, where the variation in levels of complexity can be understood by the runtime of it. Because this is a sector focused for strategy action, the functions of low complexity are rarely executed and with a lot less time consuming compared to the other activities that are very complex.

The analysis generated the area of strategy, demonstrated a great concern that was previously unknown, mainly due to unfamiliarity with the number of complex activities, began

a process of redefinition of roles and responsibilities between customer and its own area, for the activities might be categorized to their value, not only be categorized by the instructions released by employees. In analysis, the model application reengineering, contributed primarily to the restructuring and identification of activities performed by employees of the area in question, observing that many activities were repetitive and without value to the business.

6. FINAL CONSIDERATIONS

The analysis, generated by studies, allowed observing that the implementation of Lean is not directed only to operating businesses, but also for administrative sectors within an organization where the main role is focused on improving and restructuring activities. Seeing the implementations, the biggest challenge was to show all points, and turn them into practical, creating especially that they could start to show up, and free the employees' minds. Changing the idea of something logical into real is the greatest challenge.

After this analysis, several tasks could be generated, because at any moment it was clear to the team that the implementation of this model would not reduce the workforce but would decrease rework and activities that should not be executed for more than one member.

At any moment the team was involved to approve the steps that were being followed because the main value of work performed by the area was in each employee and with the confidence that was required of each element to the approval of each segment of the implementation process. The generation of the team's performance was evident with the generation of the amount of work done versus the time spent by the performed task. Some evident aspects came up as a group of 13 people executed a fifteen-person-activity, and this fact was crucial to the decision moment of each group member to assist in the implementation of Lean in an area that had served as support Company A so far.

Despite having worked on improvement in the strategic area, was not considered the variation of errors within the processes executed by members of the area where this study was limited in improving processes in which they were made for more agility generating greater productivity of its activities getting rid of some steps that were previously made.

For further analysis, will be interesting to analyze the errors generated for the execution of processes, using tools like Six Sigma for more detailed features of processes that impact directly or indirectly the implementation of activities within the study area.

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