

Study for Implantation of Lean Philosophy in the Supply Sector of a Brazilian University

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Abstract: According to Womack and Jones (2004), lean thinking or Lean philosophy is a way to perform operations and processes more effectively, with less human effort, less equipment, less time and less space, seeking the elimination of all waste, that is, all activities that do not add value. The study in question sought to analyze the supply chain of a Brazilian University, within the Lean philosophy, considering the activities involved in the Procurement Process and the relationship with the supplier. Based on descriptive exploratory research, the concepts aimed to show the influence of information systems in the supply chain, the importance of performance indicators to assist in the comparison, as well as analyzes of planned and effective strategies in the evolution of the purchasing process and procurement of materials. The acquisition of supplies was studied in order to have the least time and effort to achieve greater competitiveness and profitability, with a focus on reducing logistics costs and excessive wasted time in processes.

Keywords - Lean, University, Philosophy.

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I. INTRODUCTION

In the 1980s, following Toyota's success during the oil crisis, an extensive automotive survey conducted by the Massachusetts Institute of Technology (MIT) sought to identify its differential, leading to the publication of the book "The Machine That Changed the World" by James P. Womack, and Daniel T. Jones and Daniel Roos. The characteristics found and condensed in the work, were baptized of Lean, or philosophy Lean, that is commonly called lean thought.

When applied in a given system, the Lean philosophy contributes to lean process efficiency and processes. Its principles seek to eliminate activities that are ultimately unnecessary and do not add value to the end.

Womack and Jones (2004) demonstrate that lean thinking is the way in which operations and processes are carried out with less human effort, less time, space, and less equipment, as well as the ability to solve problems in a systematic way.

Analyzing the purchasing and warehousing process, linked to the education sector, through the philosophy of the Japanese automobile industry of the 20th century, the focus is the elimination of losses in the processes, to avoid wastage such as suggesting the elimination of flows to improve satisfaction with supply chain service and points where logistics may be deficient.

For a long time, companies adopted through mapping of times spent in process steps, and analysis of their flows, the lean philosophy, having as main result, besides the increase of performance, increases a significant gain with respect to costs as a practical consequence. Lean has also been widely used in services, construction, information technology, and leads to the consideration that those who limit the applicability of philosophy in areas that do not go beyond industry are mistaken for ignorance.

II. MATERIAL AND METHODS

The methodology has "its fundamental purpose, to show that, although science is not the only way to access knowledge and truth, there are essential differences between scientific knowledge and common sense" (Marconi, Lakatos 1991: 39).). This was followed by the descriptive and exploratory character, the initial steps being taken in order to raise the principles of Lean Philosophy for later analysis. In addition to the principles, a number of wastes of the theoretical scope were also studied, all of these data were compared within the available literature, and were therefore framed so that once in the field both principles and wastes were possible to be recognized .Analysis of activities as well as questions with collaborators in order to map the actions, flows and supply chain were carried out with simple questionnaires in order to fulfill the requirements of measuring the scope of the Lean philosophy, later suggestions through tabulations and flowcharts were designed in order to guide a lean thinking for the future of the sector of the study in question.

III. RESULT

Since all studies were based on the literature, an accurate observation of the Lean principles is required, as shown in Table 1. After the generation of Figure 1, an analysis of the principles was performed to give rise to Figure 2, which will be explained later. According to Lustosa et al. (2011) the essence of Lean thinking is value, and this value can only be defined by the end customer, and for authors the need is the source that generates value, Womack and Jones (2004) define value as a good or service that meets the needs of the client, being the case studied, the value linked to the services rendered with the least possible inputs, and possible costs.

Table 1 –Lean Principle Studied.

Principle	Questions
1	Value
2	Value Stream
3	Continuous Flux
4	Pull Production
5	Seek Perfection

Source: Authors

With regard to the other principles, such as value flow, and continuous flow, are understood according to Lustosa et al. 2011, the set of all the activities that take place from the request of the items, their use in the different manifestations, until the process of their final consumption, are dependent. The function of the flow of value is to identify the steps that add or not value, some of which are useless, which generate wastage and expenditure of time. The continuous flow, in turn, is linked to the different tasks that can always be performed very efficiently and continuously (WOMACK & JONES, 2004, p.11). In short, one matches with gain and loss of value, and the other with time, avoiding stops, which will later be shown in figures 1 and 2. Finally, pulled output will be demonstrated in the lean mentality of figure 2, which "The best way to understand the logic and challenge of the pull concept is to start with a real customer expressing the demand for a real product and walking in reverse" (WOMACK, JONES, 2004).

Table 2 - The 8 Wastes of Lean

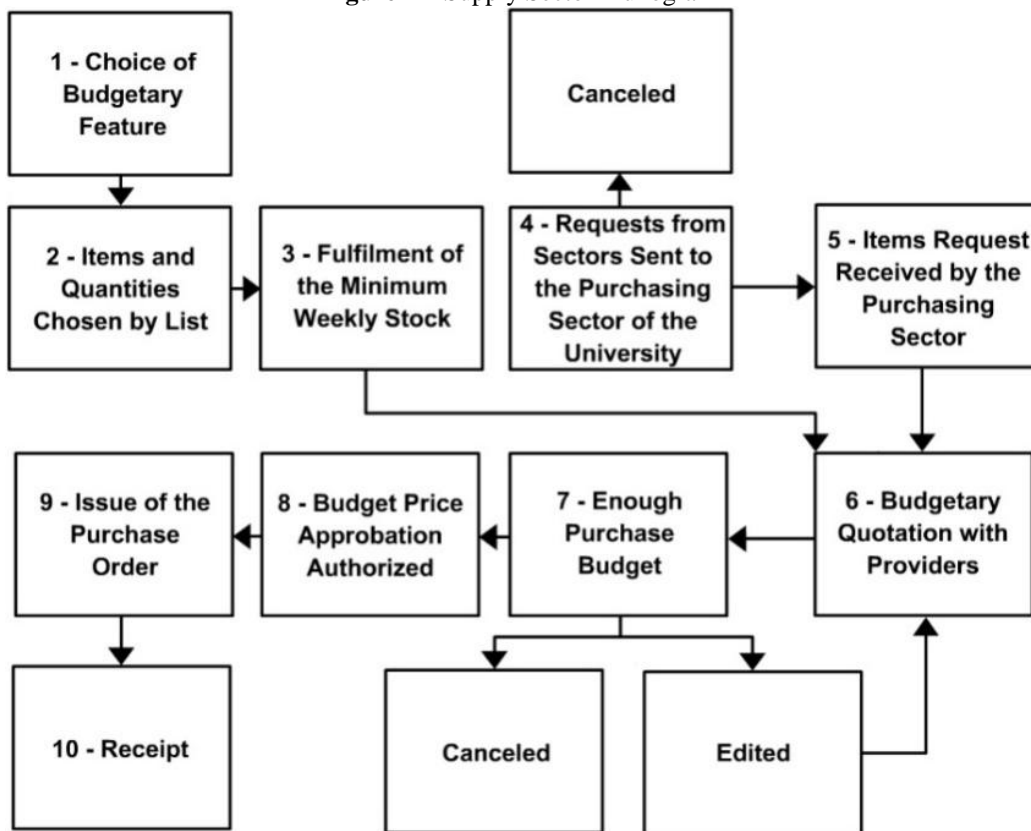
Wastes	Question
1	Overproduction
2	Waiting
3	Transport
4	Over-Processing (Inappropriate)
5	Inventory (Stock)
6	Motion
7	Defects
8	Skills (Human Potential)

Source: Authors

According to Table 2 within the Lean principles, in situ on an exploratory basis, questions were asked to the collaborators so that the study sought to identify which wastes were present in the procurement processes of the supplies, as well as the actions for reduction or elimination of those who were identified.

On waste 1, in Table 2, it can be said that, according to Shingo (1996) applied to services, that overproduction in the quantitative measure is compatible with more products than necessary, generating inventories, and anticipating needs that do not add value . According to Ohno (1996), losses due to overproduction are the main loss, since they tend to overlap with the others, due to inventories that represent devaluation and costs. In this context, the sector of supplies studied works with minimum stocks.

Figure 1 – Supply Sector Fluxogram

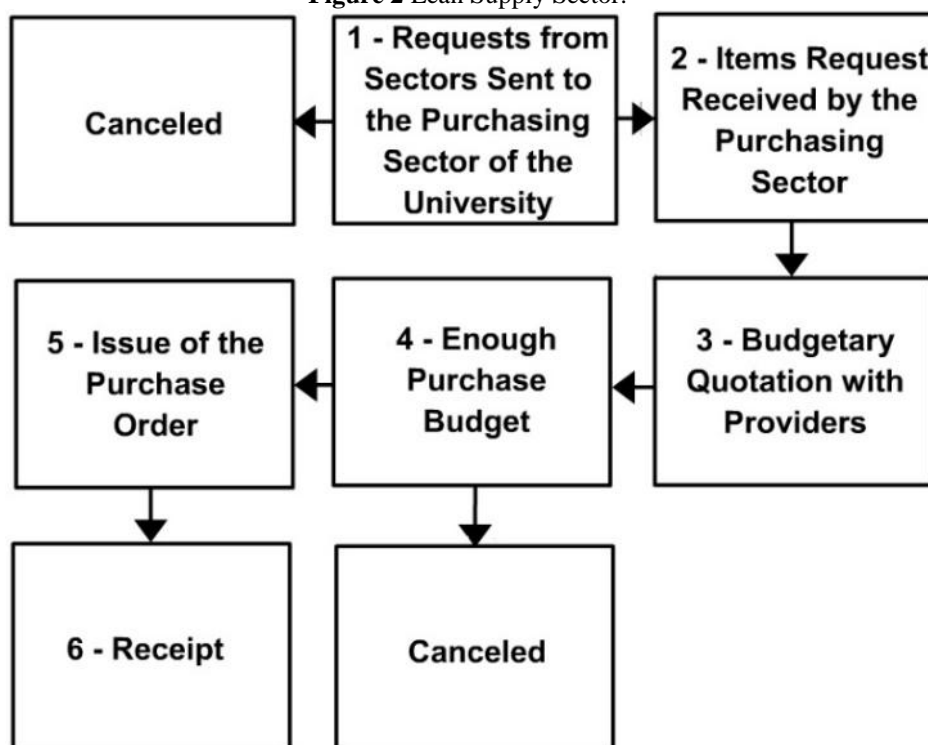


Source: Authors

The Supply Sector of the University in question, works with two Warehouses, one dedicated to the works and the other to the general supplies, supported by logistical support. The collaborators say that the greater turnover of stocks occurs with respect to cleaning products, kitchens, and office products. A minimum stock list is supplied weekly, in two ways, one through the normal compensation system shown in 1 to 3 in figure 1, and the other through the requests coming from the sectors that need the supplies, evidenced by the process from the number 4. The efforts of the study turned in the observation of the General Supplies Warehouse, once the warehouse of works is only supplying repairs by the demand coming from projects. According to Womack and Jones (2004) efforts to improve the process must be constant and managed, directly involving the reduction of waste present in the process, with the key employees, where their attitudes reflect the organizational results and the work environment. Thus, after due understanding of the principles and wastes, steps were identified that were due to errors or problems with the system. As shown in Figure 1, the steps in Editing and Supplying a Minimum Stock are activities that have as their common point, first, the need to supply a system that does not add value, but also, secondly, correct errors both by the absence of requests to comply with stock, and orders made in the wrong way. Shingo (1996), showing that the Lean philosophy system is also linked to doing the activities once, correctly, in the right way, avoiding rework, sheds light on figure 1 that denotes some of these points of rework.

Thus, it was suggested the need to implement a policy of continuous improvement with the logistical support staff so that the leveling between service capacity and the demand for inventories, in addition to the continuous flow of the process and the reduction of the " The objective of adopting this strategy is to reduce the times of crossings and later the total elimination of the stocks "(ANTUNES et al., 2008, p.214). Thus, Figure 2 aimed to comply with the principles of absence of inventory, transferring the awareness regarding the continuous flow and improvement, to the employees of the sectors, who would accelerate the requests and do them to their needs, not allowing the existence of products that not being constantly employed, be it cleaning materials, canopy, or office, as visas being the most widely used.

Figure 2 Lean Supply Sector.



Source: Authors

The Lean philosophy is a powerful ally against waste, which ultimately contributes to the accomplishment of operations and processes effectively and without the entanglement of complexity that often results from the lack of lean thought. The activities shown in Figure 1 can be reduced in order to speed up the procurement system and therefore work with less wastes of materials that are long in stock, even if minimal, and carry out all the work aiming at a single execution time, in the right place, and without waste.

IV. CONCLUSION

Studies of the software and operation of information systems are necessary for a total optimization of the process. The elimination of steps that do not add value in the future can be introduced directly into the systems, preventing wasted time and activities, through feasibility studies and accessibility of collaborators to information systems.

Difficulty of the collaborators themselves regarding the system involved prevented a deeper analysis and a commitment so that the approaches were applied in practice. Many of the work involved in relation to research without an initiative that gets managers and interested first, only turns in the descriptive character. The knowledge acquired is valid, since the scope of study once corresponded with a certain degree of application and vision in operation generate mutual opportunities of growth.

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