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Lean Manufacturing and ergonomic working conditions in the automotive industry

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Abstract

With the new market scenario along the years the great automobile multinational companies are leaving for the challenge of reducing production costs. This production system is the Lean Manufacturing a model that serves to facilitate competitiveness in several segments, aiming to eliminate waste (No Value Added) and also in improving working conditions. For the auto companies the application of Lean Manufacturing within your concept is being improving production processes, involving its parts suppliers, raw material consumption and operating since the beginning of its production, to finalize their finished products. The main goal of ergonomics is to develop and apply the man adaptation techniques to their work and efficient and safe ways in order to optimize the well-being and thus increasing productivity. In this study we applied some methods of analysis process by the correlation with implementation of Lean Manufacturing and working conditions in ergonomics. In which refers to the results (Quantitative - same volume of products with the lowest number of employees) and the (Qualitative - faster, accuracy, timeliness and improved quality of the product). Through this data collection relating them between theory, physical implementation, concepts and ideas between those involved, the focus of the tool applied on the conditions of the posts / workstations and which return benefits provided through the interviews. This study demonstrates a result of analysis of objectives achieved by continuous improvement applied between the elimination of waste and increased productivity and the impacts, the ergonomic conditions to carry out operations and consequently the results achieved in improving the productivity and well-being of its employees.

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1. Introduction

With the new market scenario along the years the big auto multinationals are leaving for the challenge of reducing production costs, wanting to be more competitive than other not to lose their market shares, therefore there is competition between them we can say every minute that passes. In this global competitive market for this type of follow-up in the production of motor vehicles, parts of them appreciate good at evolving their products in technology, designer, comfort, security, diversification of colors and quality in its products all this, but in order to reduce the production costs, all are seeking such a guarantee in the competitive market. And for automotive companies to keep this market, they seek to use tools in the context of continuous improvement in their production processes.

A widely used tool some time since the 1940 season in order to get a (Lean Production) for a production system Lean Manufacturing is a model that serves to facilitate competitiveness in several segments, aiming to eliminate waste (not Value Added) and also in improving working conditions. For the auto companies when the application of Lean Manufacturing is to be improving production processes from the supplier of raw materials and consumption to its final production of their products. Enabling with some tools to help in this application to a set of activities encompassed with better resources and lower costs.

The Lean Manufacturing opens up a range to insert other tools that aid, such as: (Kaizen, 5 Senses, Poka-Yoke, Takt-Time, Balancing stations or workstations, supply flow of parts and products, Flow Mapping Value, Safety, Ergonomics, etc.). In the application of Lean Manufacturing should be made a direct correlation between vision of working conditions with a support tool mentioned the (Ergonomics). Each continuous improvement held in any work environment, this correlation can be carried out in order to adapt the improvements to the executor of activities.

The main goal of ergonomics is to develop and apply the man adaptation techniques to their work and efficient and safe ways in order to optimize the well-being and thus increasing productivity. The concept of ergonomics applies to the quality of adaptation of a machine to its operator, providing an effective handling and avoiding an effort worker extreme in implementing the work. The repetitive stress injuries (RSI) are the most common physical problems that can cause limitations or inability to work. Using ergonomic solutions in the workplace is an initiative that can significantly increase the levels of satisfaction, efficiency and worker efficiency.

2. Theoretical basis

The evolution of lean production process (*The Toyota production system originated in Japan, the Toyota car plant, just after the Second World War. At that time the Japanese industry had a very low productivity and a huge lack of resources, which prevented from adopting the model of mass production ...*) [1].

Within this context and seek improvements to the production process two ambitious engineers (Kiichiro Toyoda and Taiichi Ohno), ventured on a mission to understand the process of Americans on a visit in car plant FORD US which in turn, developed a differentiated production system and a mass production process. This process was called and popularized in the production of the model "Ford T" where vehicle production was high and low prices of these products, and the high proportion of machinery in relation to numbers of workers.

After this visit the US and to understand the process and make various analyzes and correlations, the Japanese had in mind that this production model in mass would be no way that could be applied in Japan. So the idea to develop a production system known worldwide as Toyota Production System (TPS) following an original production line of reasoning based on Henry Ford and Frederick Taylor with the development of mass production, and Taiichi Ohno was presented as continuer of Ford. And to continue with the improvements in the production system of "Toyota" they already had another thought in performing the production of small batches, with the aim of improving a production line with more varieties in their products produced in smaller batches diversifying the colors of their vehicles. For example, in a batch of 10 vehicles 5 of them will be in a different color.

Eventually perfecting ideas on improvements within the production system to leverage profits by reducing these production costs in order to identify and eliminate existing losses, which means acting which does not add value to the product.

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