SEVEN publicações acadêmicas
EM PARCERIA COM: IEMS UNIASSELVI

Customer satisfaction with a quality product based on the philosophy of lean production

Rellyson Paulo de Sousa[1], Mauricio Johnny Loos[2].

ABSTRACT
Globalization has made the market even more competitive, demanding cost reductions and better levels of productivity, quality and other requirements. Currently, in addition to having production based on low costs and maximum efficiency, another requirement in the market that is making a difference in productivity is the quality of the product produced in a production model called lean production by Krafcik (1988) as opposed to buffered production which, according to the author, characterizes mass production.

Keywords: Customer, Globalization, Market.

INTRODUCTION

Globalization has made the market even more competitive, as it requires cost reduction and better levels of productivity, quality, among other needs. Currently, in addition to having a production based on low cost indexes, with maximum efficiency, another requirement that in the market is being a differential in productivity is the quality of this product produced in a production model called by Krafcik (1988) lean *production* as opposed to *buffered production* which, according to the author, would characterize mass production.

A product made with maximum quality and diversity, which meets not only one, but a range of people with different needs, is the key for the company to establish itself in this competitive market. Producing efficiently with minimal waste and resulting in a product that is easily accepted in the consumer market enhances the company's name, making its product a differential.

This study started from the interest in verifying the appropriate means to obtain a competitive product in the market with maximum quality, considering that the customer is the determining factor for the aggrandizement of the company based on his opinion about the product offered.

The elaboration of this research refers to the theme of the quality attributes in the product that the customer considers most important for their satisfaction, based on the contribution of lean production in obtaining these values. This subject is of total importance, because it is perceived that a fixed product in the market gives identity to the company, making the customer associate the brand with the product. It is up to the company to accept the challenge of achieving low-cost production with excellence in the quality

[1] FBUni – Centro Universitário Farias Brito - CE
[2] FBUni – Centro Universitário Farias Brito - CE

of what is being produced. Product quality is the key to growth within an increasingly competitive and demanding. For Drucker (2002, p. 35), "there is only one valid definition for the purpose of a company: to create a consumer".

Considering that this research deals with the quality of the product made in the mold of lean production, we define it as a bibliographic study, in which it is intended, through theorists such as Peter Drucker, John Kotter, Taiichi Ohno, John F. Krafcik, among others, to describe the importance of product quality for business aggrandizement, in addition to characterizing the means of production that makes a competitive product viable. with low cost and high quality.

OBJECTIVE

Based on the concepts of lean production, it is intended to direct this research to the following question: what does the final customer consider important for the product to have for their total satisfaction, based on the concepts of lean production to obtain these values?

METHODOLOGY

The methodology is the central point of the research. In it, all the procedures carried out during the process are ordered. For Trujillo (1974, p. 24) "method is the way of proceeding along a path. In science, methods are the basic instruments that initially order thinking in systems, they trace in an orderly way the way the scientist proceeds along a path to achieve a goal", that is, the method determines which path the researcher should follow to reach the best results.

Gil (1999, p.42) defines research as a "formal and systematic process of development of the scientific method. The fundamental objective of research is to discover answers to problems through the use of scientific procedures." In view of this, this research will bring, in addition to the discussion on lean production, contributions for all who are interested in the object studied.

In order to achieve the objectives of this quantitative work, a brief bibliographic research was carried out, based on scientific articles and a questionnaire was applied to clients of several companies, and this questionnaire is presented in Appendix A. According to Fonseca (2002, p. 32) the bibliographic research "... It is based on the survey of theoretical references already analyzed and published by written and electronic means, such as books, scientific articles, web site pages. Any scientific work begins with a bibliographic search, which allows the researcher to know what has already been studied on the subject. There are, however, scientific researches that are based solely on bibliographic research, looking for published theoretical references with the aim of collecting information or prior knowledge about the problem to which the answer is sought."

By opting for bibliographic research, we thought about the possibility of complementing the ideas of other researchers who achieved their objectives and bringing above all, writing as an object for further research. It is important for the researcher to relate his/her ideas to the bibliography consulted. Regarding quantitative research, it will bring the validation of bibliographic studies through data, results of the application of questionnaires. In this way, the research will be realistic, objective and clear, as shown in the following results.

DEVELOPMENT

Considering the need to create a model that would meet the new market demands, the concept of Lean Production emerged in 1950. This new way of controlling production was developed in Japan through research by two engineers, Eiji Toyoda and Taiichi Ohno. On a visit to the Ford factory, which used the mass production system, the engineers realized that copying or improving this production system was unfeasible, as the intention was to reduce waste and produce what was necessary that would not overload the factories' inventories. To do this, it would be necessary to create a new system that would meet these demands. If we consider the capacity of inventive excogitation of the human being, supported by current technologies, striving for the creation of products or services based on the real needs of consumption, it is corroborated by the thought of Pavitt (1984), product innovation is directly related to the intensity of patents and process innovation to the complexity of its technology, especially with regard to the development of new methodologies to increase the added value of products and services. In view of these ideas, a production method was thought of that would substantiate the new manufacturing scenario, the Lean Production System, which was taken as the Toyota Production System because it was proposed in the factories of the Toyota company.

The scientific research that fostered the "Lean Production philosophy" had an effective technological contribution, modernizing the concepts of productivity and leveraging the industrial productive sector, improving processes and expanding the capacity for innovation and cost savings. Today, high product quality with minimal waste is sought. The lean production philosophy favored the industries in the following aspects: increased productivity, improved quality of processes and products, and optimization in the use of raw materials, inputs, and other resources. These factors are the most important in terms of the permanence of industries in an increasingly competitive and demanding market.

According to Ohno (1988), in the equation of productivity (total product/quantity of work applied), in the traditional environment, in order to achieve an increase in production, it is necessary to increase the numerator by expanding the scale of production. However, in gradual periods of economic growth or decline in productivity, efficiency is sought by doing the opposite, reducing the denominator, that is, reducing the amount of work exerted in production.

This practice requires less effort from the work process, unlike the mass production model, in which as the process develops in the course of production in large quantities, the possibilities of labor intensification, the fragmentation of tasks, and the use of automation as influential in increasing productivity decrease. The lean production system adapts to every moment in the progress of production, working hard to combat waste in the production line and always keeping the focus on product quality. According to Deming (1990, p.26):

> Quality is an attribute of products, of services, but it can refer to everything that is done by people. When it is said that something has been done with quality, it is not easy to define what that quality is. It is customary to speak of: Quality of conformation (greater or lesser degree to which a product, service or activity is made with an established standard or specifications; absence of defects in relation to the standard or specification); Design quality (refers to the particular design characteristics of a product).

It is not enough just to produce in a philosophy of cost reduction, quality is the high point in the focus of companies, because the product needs to establish itself in the market and it is necessary that it transmits confidence in the end customer. This is the great challenge of the lean production methodology, to produce a product with the highest quality at the lowest cost. This ensures the survival of companies in the market, as competitiveness is growing and inconstant. The lean production system is established within the large corporations, seeking to place and remain in the market. The purpose of this philosophy is to avoid unnecessary costs, waste and sustainability so that companies have a clean production that provides products or services of high excellence.

CLEAN PRODUCTION: AVOIDING WASTE

Lean Production aims to combat waste. From this perspective, the system of mass production advocated by Henry Ford in 1914 did not meet all the expectations of Japanese entrepreneurs, who were concerned with the following question: how to store what was produced on a large scale without losing the quality of the product? The Toyotist engineers took the Fordist model as a basis to formulate a production system that would meet the production needs of the factories and avoid waste. Ohno (1997) establishes some initial steps for the implementation of the Toyota Production System: the identification of waste points and their total elimination; avoid the overproduction of unnecessary goods; Reduce the waiting time of the "employees" on the production line to finish the work or an activity, because in this context, the worker becomes more productive if he manages to master more processes within the production, that is, while his activity is not ready to be executed, he can support another point of the production making the process move without stops unnecessary, reducing time and making production effective; Avoid unnecessary processing due to inadequate designs of tools and products and the storage of products that are waiting for processing or consumption, because the philosophy of lean production produces according

to the progress of the supply of goods, so that there is no stockpiling of products that are not well accepted in the market. Another important point is the quality of what is being produced, because the essence of this philosophy is to produce with quality, low cost and avoiding waste.

Waste means any activity that absorbs resources but does not add value. The meaning of value in the vocabulary of production is nothing more than the ability to offer a product/service at the right time at an appropriate price, based on what the customer can afford. The essence of lean production is: eliminate waste, reduce production costs and maintain a focus on customer satisfaction, that is, valuing the product made.

To eliminate waste, the *Just In Time* (JIT) production system is interesting, a production management model that controls the time invested in everything that is produced. This system has the premise of controlling all production at the exact time, as well as its transport and purchase, that is, producing the right product, in the correct quantity in a minimum time. Once implemented, JIT can make the company reach zero inventory, eliminating the accumulation of unnecessary raw materials to obtain a certain quantity, consequently, waste is avoided.

With this system, the product reaches the end consumer at the right time it is actually used. The manufacture of the product is only carried out if there is demand and the manufacturing time, costs and time of permanence of this product in the sale are calculated. This makes it possible to see if the merchandise has added value.

The lean mindset competes in a philosophy that requires shorter processing times in order to deliver products or services with high quality, minimizing production costs by improving production capacity with a focus on eliminating waste. From this perspective, the time between the issuance of the order and the finished product is observed. The intention is to reduce this time, producing a product with quality excellence, focusing on reducing costs, reducing production time and eliminating waste that does not add value.

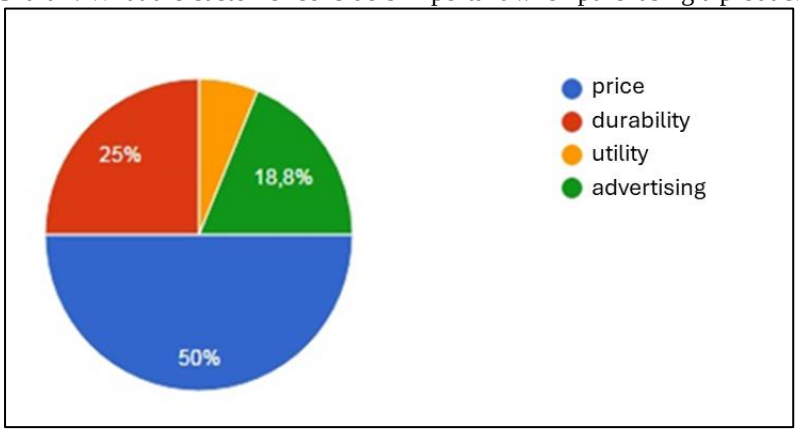
ANALYSIS OF THE RESULTS

The customer and their opinion are fundamental to the market. In this case, it is necessary to have a means of communication between the company and the customer, where it is possible to demonstrate the impression that was left after the purchase of the products. Many companies have their contact centers, where agents are ready to listen to compliments and complaints. In this way, the company gives confidence to its customers, because they know that in the event of a possible dissatisfaction, there is a way to appeal. On the other hand, there is a feedback on how the products are being received by those who purchased them.

The company needs to be attentive to the compliments, criticisms and suggestions of its customers, and make an analysis of what it is already satisfying and what it has to improve. This makes the customer feel cared for and will certainly help the products to establish themselves in the market.

It is important to understand the needs of consumers and what they are looking for in a product, especially in the case of lean production. Since some customers make a difference between an expensive and branded product, and the one that costs more. However, most still prefer the price when it comes to purchasing something, as shown in chart 1.

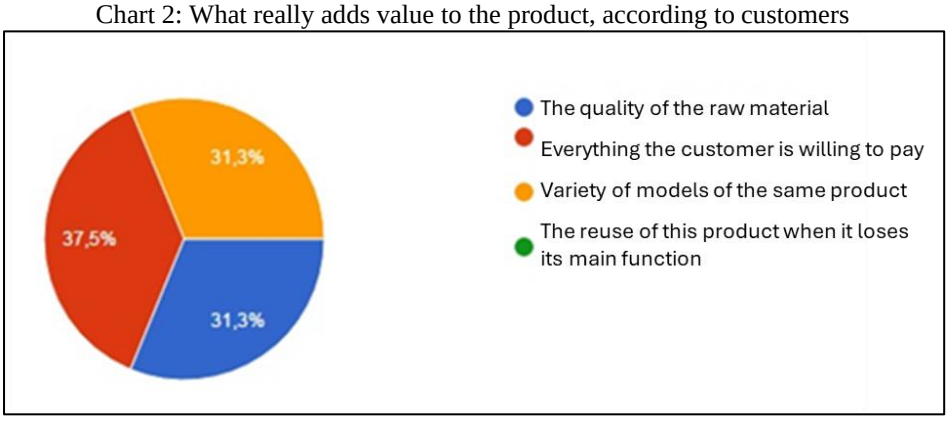
Chart 1: What the customer considers important when purchasing a product



Source: Applied Research (2018)

Kotler and Armstrong (1999, p. 133) say that "consumer behavior is influenced by four sets of characteristics: cultural, social, personal and psychological", that is, it is important to find a way to delight the customer with what will catch their attention and meet their needs and conditions. In chart 2, you can see that the customer is mainly looking for something they can afford.

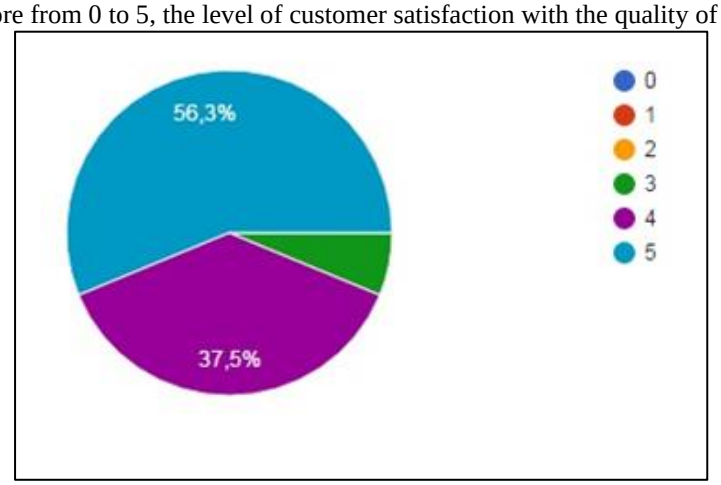
Chart 2: What really adds value to the product, according to customers



Source: Applied Research (2018)

In consensus with these results, there is customer satisfaction with lean production. Most customers say they are satisfied with the products they have already purchased, because although they are produced at a lower cost, they have variety and quality. These statements can be seen in Graphs 3 and 4.

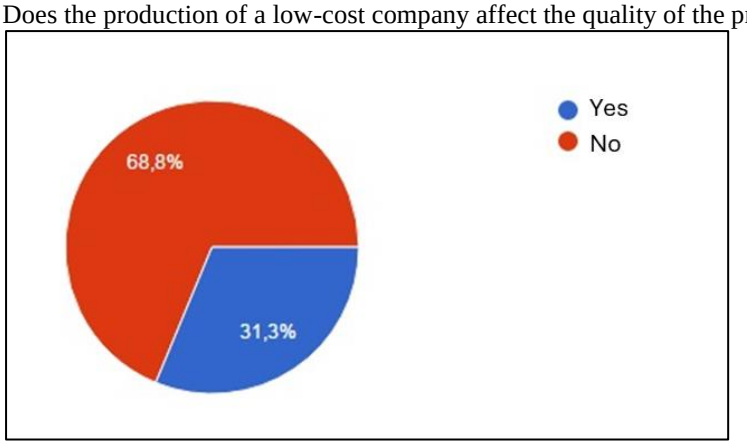
Graph 3: On a score from 0 to 5, the level of customer satisfaction with the quality of low-cost products



Source: Applied Research (2018)

The survey graphs show that the customer is willing to buy products that have quality, regardless of whether their production is done at a low cost.

Chart 4: Does the production of a low-cost company affect the quality of the product?



Source: Applied Research (2018)

They also show that variety and price make all the difference when buying. Thus, it can be said that lean production tends to evolve if it is in accordance with the interest of its consumers, which will be the differential at the time of purchase.

FINAL THOUGHTS

The present research demonstrated the importance of product quality in a lean production. Based on definitions and concepts of some authors that are part of the consulted bibliography, it was possible to

analyze customer satisfaction and what they expect as a result of obtaining a product. Companies that adapt to the bias of a lean production philosophy, according to the results, must focus on the quality of the products and with the minimum of waste, because a production that directs its efforts to a high quality with little expense, can lower the price of its products by attracting what most attracts the customer's attention: the lowest selling price.

It is important for the company to be aware of what needs to be improved, to restructure when necessary, and to listen to customers through surveys or customer service.

In an increasingly competitive market, having an attractive and differentiated product is indispensable for any organization that wants to be successful. Companies stand out from the search for improvements, aiming for maximum quality with minimum waste. Lean production optimizes production, reduces costs, avoids waste and strives for quality. These principles are the basis of a productive system, facilitate the flow of work within corporations, and provide them with an extended life in the business world.

The customer is willing to buy products that have affordable prices and high quality, regardless of whether their production is done at or without low cost. Another important point that customers aim for is the variety of the product, as everyone has a distinct need. Thus, it can be said that lean production is the means by which corporations seek to improve their line of business and evolve their products according to the interest of their consumers, as they are the ones who will direct the course of production.

It can then be said that, from the moment the company is concerned with the improvement of processes and the quality of the final product, it tends to gain a prominent place in the market and satisfy the consumer. This means the success of the enterprise, which contributes to the expansion of data on the subject, awakening in other entrepreneurs the vision that it is essential to invest in the quality of the product and in the full satisfaction of the customer in a perspective of a productive philosophy that strives for positive results with minimum waste and maximum effectiveness.

REFERENCES

Deming, W. E. (1990). Qualidade: A Revolução da Administração [Quality: The Revolution of Management]. Rio de Janeiro: Marques Saraiva.

Drucker, P. F. (2002). O melhor de Peter Drucker: a administração [The Best of Peter Drucker: Administration]. São Paulo: Nobel.

Fonseca, J. J. S. (2002). Metodologia da pesquisa científica [Methodology of Scientific Research]. Fortaleza: UEC. (Apostila)

Gil, A. C. (1999). Métodos e Técnicas de Pesquisa Social [Methods and Techniques of Social Research] (5th ed.). São Paulo: Atlas.

Kotler, P. (2000). Administração de Marketing [Marketing Management] (10th ed.). São Paulo: Prentice Hall do Brasil.

Kotler, P., & Armstrong, G. (1999). Princípios de marketing [Principles of Marketing] (7th ed.). Rio De Janeiro: Prentice-Hall.

Krafcik, J. F. (1988). Triumph of the Lean Production System. Sloan Management Review, Fall.

Ohno, T. (1997). O Sistema Toyota de produção [The Toyota Production System]. Porto Alegre: Artes Médicas.

Ohno, T. (1988). O Sistema Toyota de Produção: além da produção em larga escala [The Toyota Production System: Beyond Large-Scale Production]. Porto Alegre: Bookman.

Trujillo, F. A. (1974). Metodologia da ciência [Methodology of Science] (3rd ed.). Rio de Janeiro: Kennedy.

APPENDIX A

QUESTIONNAIRE

Dear Participant,

This questionnaire is a data collection instrument that is part of the methodological process of an academic research for the conclusion of the specialization course in Production Engineering. The Scientific Article, Course Conclusion Work (TCC), has as its central theme "the most important aspects in the customer's view for a quality product based on the contribution of lean production".

To this end, their participation in the questionnaire is a *sinequa non* condition, as part of our research methodology.

Thank you for your attention.

1 – Do you consider that the production of a low-cost company affects the quality of the product?

( ) YES ( ) NO

2 – What do you consider the most important aspect in the acquisition of a product?

( ) Price ( ) Durability ( ) Utility ( ) Advertisement

3 – What do you consider that really adds "value" to the product?

( ) The quality of the raw material

( ) Everything the customer is willing to pay

( ) Variety of models of the same product

( ) The reuse of this product when it loses its main function

4 – Which of these factors do you consider to be the main reason for a product to establish itself in the market?

( ) Price ( ) Durability ( ) Utility ( ) Advertisement

5 – On a score from 0 to 5, are you satisfied with the quality of the products made in a production model that works with low cost and variety?

( ) 0 ( ) 1 ( ) 2 ( ) 3 ( ) 4 ( ) 5