Develop a methodology to improve the quality of design of metal furniture products in light of the concepts of systems theory

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Research Summary

The product development process is what determines the ability of industrial enterprises to continue their products in competition within the local and global markets. Hence the question arises: Are the development and improvement processes that take place on metal furniture products according to a specific system and methodology that deals with all the standards necessary for its development so that it is a process capable of accommodating the functions of the basic products (usual, engineering, economic and environmental) or not?

Hence, the aim of the research was to study a quality system that is applied within the product design process as an entry point for the development of the metal furniture industry. To achieve this goal, some concepts have been discussed, such as the concept of quality, which is responsible for the quality system, and how to apply them in the design process? The research tried to reach a system to improve the quality of metal furniture through the following research axes: the concept of quality, analysis of the stages and steps of applying the quality system, a case study through the application of the quality system within the design of a product for metal furniture [Locarbezia chair]. After that, the research concluded with some relevant results and recommendations, such as: The use of a clear and specific system through which the quality of products can be improved through evaluation and knowledge of weaknesses and strengths to connect them to competition within the global and local markets, and that the design goals cannot be achieved without knowing the customer's requirements through a team marketing research and translating this research into measurable standards, determining the quality of the customer and his needs, leading to reaching the goals at the lowest cost, and finally, the development of a systematic system capable of reaching the product to global and local competition.

Keywords:

systems theory, system concept, system components, quality, product design, Qfd quality function deployment, six sigma, design functions, quality improvement.

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Introduction:

The product development process is one of the processes that determine the ability of industrial enterprises' products to continue and compete. Product development requires an integration between the scientific foundations in manufacturing and technology and the product design process according to its basic functions through a specific measurable system. The product development process is linked to advanced systems in design, product planning and improvement. It also helps the designer to be creative in inventing new ideas for development, but are the processes of development and improvement carried out according to a scientific methodology that takes into account all the determinants associated with development? Hence, this was the beginning of this research to reach a systematic approach that deals with the basic determinants of developing a metal furniture product so that it is a continuous process capable of accommodating the usage, engineering, economic and environmental variables.

Research Problem:

The research problem is illustrated by the lack of a clear system (system) to develop the process of designing metal furniture products, which occupies a great position in the local and global markets.

Research Objective:

The research aims to apply a systematic, organized and practical system to design the metal furniture product in a way that can put the product in competition and to lead.

Research hypotheses:

The research assumes that taking into account all customer requirements during the process of designing a metal furniture product achieves the systematic system for developing the metal furniture industry in a way that accommodates local and global variables.

Research Methodology:

The study in this research follows the descriptive analytical method.

Research Axes:

The study focuses on the following themes:

The first axis: the concept of quality, the goal of quality, the dissemination of the quality function Qfd, and the 6 Sigma system and their application in the quality system.

The second axis: ways to improve the quality of metal furniture.

The third axis: a case study: applying the quality system approach within the design of a metal furniture product.

Research findings and recommendations:

The search results can be summarized as follows:

1. The use of the quality system is considered a systematic entry point for the development of metal furniture products.

2. The quality system is used at the first design of the product, as well as during the development of products to achieve the requirements of customers and at the stage of post-production of the product to ensure all stages (design, production, marketing).
3. It is not possible to achieve the design objectives without knowing the client's requirements, defining and monitoring the problem, then analyzing it and setting measurable specifications.
4. Realizing the characteristics of the metal furniture product is the responsibility of the industrial establishments producing it.
5. Determining the needs and desires of customers before starting the design saves time and effort and puts measurable considerations.

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