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DESIGN VERSUS PRODUCT DEVELOPMENT?

DESENHO VERSUS DESENVOLVIMENTO DE PRODUTOS?

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Abstract

Design or product development? The questioning in relation to the employment of such terminology dates back to possible misconceptions regarding interpretation and approach them. Therefore, it can be stated that there are differences between these two terms? In this context, we highlight two views concerning the origin of the design. The first character creative and based on pre-industrial revolution, based on projective and methodologies directed towards the practice of designing products. And second, where design is understood as an industrial process: the development of new products includes, besides a creative procedure are developed, and symbolic formal solutions for products, but also a technical procedure based on the definition of the requirements concerning the product engineering. Is this the most widely accepted interpretation? Theoretical studies were conducted from interpretations of the concept of the design proposed by the International Council of Societies of Industrial Design – ICSDI (2012), and for the characterization of the process of product development, we sought to develop an analogy between these two terminologies and can be proved that the use of one of terminology will not cause deviations of interpretation, since both deal with the life cycle of the product. The main results obtained until now the definition of design proposed by the ICSID where it is characterized as a creative activity focused on the complete life cycle of products is the more approaches of the concept of product development. From the perspective of product development, it can be noted that this is characterized as a set of activities that, from the identification of market opportunities, execute seek planning products adequately to technological limitation sand strategy of the organization to ensure the productive capacity, the insert also on the market with the discontinuity of the product. This is configured as a single process, where design and engineering participating in the same process, making it more sustainable.

Key-words: design, product development, methodology, analogy.

Resumo

Desenho ou desenvolvimento de produtos? O questionamento em relação ao emprego de tal terminologia remonta a possíveis equívocos de interpretação e abordá-los. Portanto, pode-se afirmar que existem diferenças entre esses dois termos? Neste contexto, destacam-se dois pontos de vista sobre a origem do design. O primeiro caráter criativo e com base na revolução pré-industrial, com base em metodologias projetiva e voltada para a prática de projetar produtos. E, segundo, onde o design é entendido como um processo industrial: o desenvolvimento de novos produtos inclui, além de um processo criativo são desenvolvidos, e as soluções formais simbólicas para os produtos, mas também um procedimento técnico com base na definição dos requisitos relativos à engenharia de produto. É esta a interpretação mais aceita? Estudos teóricos foram realizados a partir de interpretações do conceito do projeto proposto pelo Conselho Internacional das Sociedades de Design Industrial - ICSDI (2012), e para a caracterização do processo de desenvolvimento de produto, buscou-se desenvolver uma analogia entre estas duas terminologias e pode ser provado que a utilização de uma das terminologias não irá causar desvios de interpretação, uma vez que ambos os acordos com o ciclo de vida do produto. Os principais resultados obtidos até agora, a definição do projeto proposto pelo ICSID onde é caracterizado como uma atividade criativa voltada para o ciclo de vida completo de produtos são as mais abordagens do conceito de desenvolvimento de produtos. Na perspectiva do desenvolvimento de produtos, pode-se destacar que este se caracteriza como um conjunto de atividades das quais, a partir da identificação de oportunidades de mercado, buscasse executar o planejamento de produtos de forma adequada às limitações tecnológicas e a estratégia da organização, de modo a assegurar a capacidade produtiva, a inserção no mercado com também a descontinuidade do produto. Este se configura como um processo único, onde design, engenharia e demais especialidades envolvidas participam do mesmo processo tornando-o mais sustentável.

Palavras-chave: projeto, desenvolvimento de produto, metodologia, analogia.

1. Introduction

The industrial revolution brought about the development of production processes for new products, evolving from a craft industry to a production of industrial character. These changes led to a series of gradual changes in organizations, especially in how its products are designed, engineered, produced and released in the market.

Within this context, it is clear that the terminology associated with the process of product development, distances itself from an isolated action from both internal and external customers of organizations. This process is proposed for the understanding of all stages of the projective act in a unified manner in order to create and schedule a corporate culture focused on the pursuit of customer satisfaction from the reduced use of resources. On the other hand the design can be highlighted in the sense that, according to the National Confederation Industry (1996), is characterized as a creative process and solution provider, based on the development of functional aesthetic values, advancing to productive spheres, technological, cultural and economic.

Thus, is it possible to point out differences between design and development of products that may restrict the use of one or other terminology?

Therefore this study aims to, through literature review, investigate and expose conceptual and operational characteristics of design and product development in order to verify that the use of either will cause differences in terminology propositions.

To achieve the proposed objective of the study it was developed an investigative study, trying to format an overview of issues that encompass the theme of work. The study initially addresses theoretical aspects in order to characterize the design and product development. After completing this task, it seeks to develop an analogy between these two terms, thereby seeking to identify compatibility between them in order to show that using one of the terminologies will not cause interpretation deviation.

2. Design or product development?

Gaining market requires organizations, in order to achieve market differentiation, the development of actions that enable competitive advantages over the competition, through strategies such as reducing costs and increasing productivity. In some industries, especially those that rely on product development, the ability to differentiate in the market, according to Petter (2009, p.02), "should value how their products are designed, manufactured and presented". Therefore, Varandas Junior and Miguel (2012, p.185) emphasize that this condition is configured in a fundamental way for "building and sustaining competitive advantages".

In this context, Dias Filho (2004, p.03) states that design acts as "a link between production processes and users". Since, according to the author, this bond is shown as a "strategic tool indispensable to the extent that it can interpret the desires of people in order to materialize them into products".

However, Wolff (2010), Libânio (2011) and Lorenzini et al. (2011) emphasize that the design process is still presented in a confusing way for organizations, especially with regard to the staff and processes involved. This happens to such a degree that in certain industries, the design is still seen with the purpose of just "beautify the previously planned product, absenting it during the integration steps that comprise the project" (Godoy et al., 2012, p. 780). Based on these considerations, according to Barros Filho (2003, p. 03), defining the design is not a simple task, "because it is a multidisciplinary activity that presents itself through various qualifications, the conceptualization of design is done in a broad and abstract way, which causes misconceptions about its real understanding".

The analogy between design and product development has been debated by researchers, such as Eguchi and Pinheiro (2008) and Gomes and Passos (2011). They highlight that possible

misunderstandings as to the interpretation of these two terms may be associated with interpretation of the concept as well as the role of design within organizations based in developing products. This view is supported by Monteiro, Valente, Paschoarelli and Silva (2007) by highlighting a constant concern to distinguish design from other activities characterized by development and production of artifacts.

2.1 Fundamentals of Design

The term design ascended through the Industrial Revolution when the production of mass consumption began to spread across Europe. According to House et al. (2007), artisans and intellectuals sought to define a concept to translate the product design process, from the initial idea through the production on an industrial scale. During the time of the Industrial Revolution, the main feature sought in a product was functionality, even though there were already efforts to improve the appearance of the products. However, it was only in the early twentieth century, especially in Germany, through the Bauhaus school[1], that studies regarding the aesthetic improvement of industrial products combining form to function started.

The concept of product design has evolved over time and currently, the designers not only concern about the visual appearance of the product but also with the needs of the target audience and the relationship among the product developed, mankind, and environment.

Conceptually for Maldonado (1961), design is a projetual activity that consists in determining the formal properties of objects to be industrially produced.

Kotler (1989) ensures that the design is an attempt to combine customer satisfaction with the company's profit, innovatively combining the five main components of design: performance, quality, durability, appearance and cost.

Schulmann (1994) argues that design is a process of multidisciplinary character project, focusing on solving problems related to the development of a new product.

Bonsiepe (1997) highlights that the design seeks to improve the quality of the products developed through adaptation of morphological and functional aspects, of production processes, and of the materials used in manufacturing, to enable the design of products socially included and sustainable.

[1]School of Art, Desing and Architecture (1919 – 1933), which aimed to "reconcile the handmade wisdom with industrial production, identifying in the figure of the designer not only a creator of forms, but also na expert in materials and technologies employed" (MONTENEGRO, 1995, p.178).

For Gomes Filho (2006), the design is the tool with which people can count on to get better results in the quality of objects in general, because it is where the designer plans to implement all the desired qualities of a product, tied up to its technological nature and all other existing processes in its production phase.

Niemeyer defines design as a scientific activity of designing, therefore, the "project is the way in which the professional, equates, in a systemic mode, data from ergonomic, technological, economic, social, cultural and aesthetic nature, answering concretely and rationally to human needs" (2009, p.22).

Thus the updated definition of International Council of Societies of Industrial Design (ICSDI. 2012) is highlighted, where the design is a creative activity whose aim is to establish the multi-faceted qualities of objects, processes, services and its systems in whole life cycles. Therefore, design is the central factor of innovative humanization of technologies and the crucial factor of cultural and economic exchange.

The concept of design also defines a social and cultural aspect, which the designer should know, study and take into account when creating a product or project. Thus, Kunz (2002) reports that design activity imply a taste that is identified in the cultural set of a society. The observation of customs and preferences is what should provide the guidelines of the project. Thus the successful form of a design would be a compilation of the conveniences of a particular social group.

Regarding the understanding that the designer should have of the target audience prior to project development, Löbach (2001) mentions that in the process of product usage the user needs are satisfied by providing certain functions to the product, in the process of configuration of industrial products, the designer and the industrial designer have to optimize the functions of a product aiming to satisfy the needs of future users. From that, it is understood that the industrial designer should know the multiple needs and desires of users and user groups, in order to provide the products with the appropriate features for each case.

It is also highlighted that the success or failure of a product, nowadays, depends extensively on a good design, and because of this more and more companies invest in specialized professional and research in areas related to design. "Design is a process that never ends and its management are essential to the success of the innovation policy of a company" (MOZOTA et al., 2011, p. 63). Thus, also according to the author, two purposes for managing the design by organizations are distinguished. The first is to provide an understanding among management processes and design between managers and designers. The second one refers to the ability to integrate the management methods to design processes determined by the organization.

It is possible, then, to verify the importance of the influence of design not only in the creation of products, but also in the definition of policies, making it essential for the organization to reach commercial success.

It is perceived then, that design is increasingly present in the context of organizations and the value created from its implementation as well as the possibility of managing the same has become crucial. On the other hand, although it is possible to identify the possibilities of design, few companies have the understanding on how to manage it. The vast majority of companies still present some resistance to include it in their strategy according to Martins (2004); Brunner et al., (2010) and Wolff et al., (2010).

Thus, is it possible to point out differences between design and product development? Are there conceptual or operational differences that may restrict the use of one or other terminology?

2.2 Differences between design and product development

In this context, Eguchi and Pinheiro (2008) highlight two views concerning the origin of the design as a basis for understanding its scope. The first, of creative character, based on pre-industrial revolution, focused on project methodology and oriented to the product design based on the needs and desires of customers.

As for the creative character, the projective methodologies widely spread in the context of product design stand out. Where, according to Baxter (1998, p. 64), "the projetual methodology is a guiding element that serves to facilitate and organize the steps necessary to solve a problem." However, according to Camiloti and Maffazioli (2011, p.03), predominantly in the area of design, "it is observed that projective activity, supported by widespread methods, focuses on addressing the issues in a somewhat Cartesian way, with reduced reflective, critical and analytical intake".

To Bomfim (1995), the use of a methodology is required due to the increasing complexity of the variables involved in a project, indicating a model with five variables that determine the development of the project, such as: the designer, the organization, the consumer, the company and the product itself, which represents the need of the market and the consumer. The same author, according to Camiloti and Maffazioli (2011, p.03), also mentions "that the methods are tools used in the development of a product and depend on the technical and creative ability of those who use them".

According to Table 01, it can be verified that, in a general review, the flow of projecting new products based on projetual methodologies mentioned follows a common cycle. These stages of development of design projects are presented in Figure 01.

Figure 01: Stages of project development of the company.

Source: Author's collection (2013)

From the perspective of the design of new products, according to Figure 01, it can be seen that the methodologies analyzed have as the initial stage of each project the conduction of a briefing. At this stage, the consumer informs the expectations, that is, what need to be done by the organization, which verifies the problem to be solved. From this evaluation, the company offers alternatives to the contractor by developing the concept for the product to be produced.

Subsequent to briefing, comes the draft project, projetual stage of the design of new products, in which the company verifies if the project is able to be forwarded or needs altering in order to be consistent with the needs of the costumer.

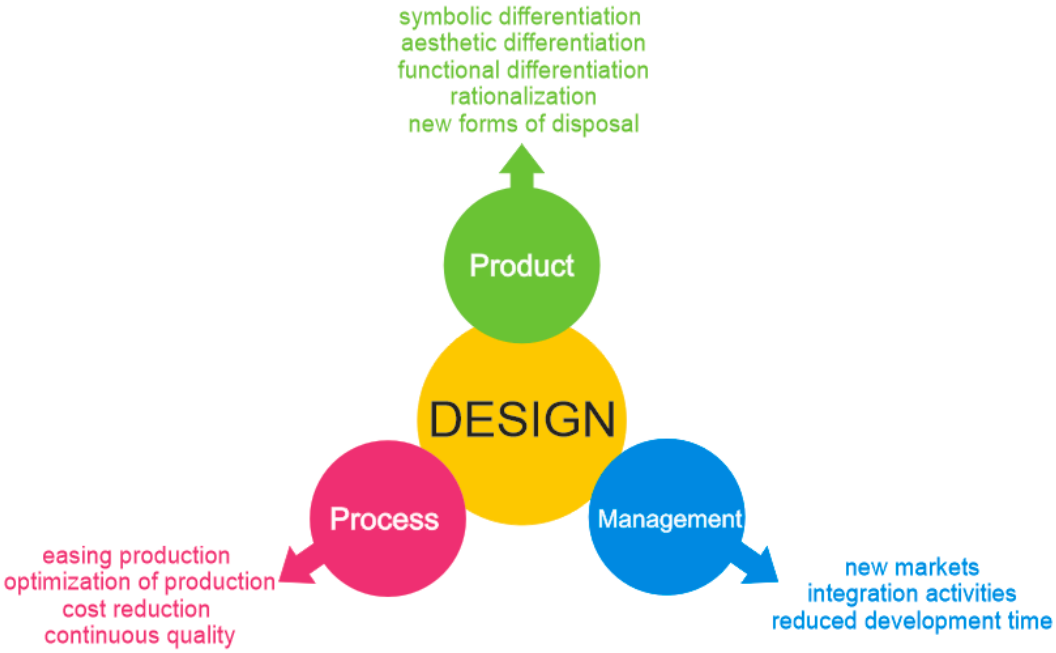
After the draft project approval by the consumer, the development stage starts, in which the company seeks to solidify the concept already defined in the draft through a solution that is definitive. It occurs through detailing the approved draft, in the preparation of technical documentation, verification of materials that will be used and the development of adjustments that are necessary for the understanding of the project by the customer. Still at this stage, a virtual presentation is built through the use of specific software so that the solution can be presented to the contractor and approved.

From the service request to the company, the definition of the scope of the project is initiated, formally ratified by the signing of a service providing proposal, in which the deadlines, activities and responsibilities of both parties are defined, and also the fees and forms of payment. This proposal is adaptable to each type of service request, so that the projective stages are established in a personal manner. According to Phillips (2008, p.87), “detailing the project scope is also called briefing, developed collaboratively between the applicant and the project group”. The manager of new product planning, represented by the designer of the company, has the operational responsibility for implementing the project. Thus, the company uses the performance of this manager in the events that lead to the changes in the project scope, assuming, thereby, there responsibility for the renegotiation of it. With the projetual solution approved, the executive project begins, stage related to the manufacture of the product developed and the consequent finalization of projecting the new product.

As for the second view presented by Eguchi and Pinheiro (2008), design is understood as a manufacturing process, meaning that, the development of new products encompass beyond a creative procedure, seeking to define formal and symbolic solution of the product, as well as a technical procedure, based on the definition of requirements relates to product engineering[2]. This view, still according to the authors, is currently the most accepted interpretation.

From the perspective of developing new products, managing desing, according to Magalhães (1997) and Mozota et al. (2011), should manifest itself in three levels, as described in Figure 02.

Figure 02: Levels of activity for design management.



Source: Adapted from Dias Filho (2004).

To Avendaño (2002) managing the design refers to a "set of diagnostic activities, coordination, negotiation and design activities that can be developed both in the external consultant activity and in the organization itself, interacting with the sectors responsible for the production, financial-economic and marketing planning, enabling its active participation in the decisions of products". Also according to the author, it displays a magnified view, integrative and interactive with all parts that make up the design process.

Still, according to Gomes and Passos (2011, p.07), with the development of engineering and design, were added to the process of product development issues related to "cost, marketing and manufacturing, for example. And the current reference models of each view no longer differ in their process". In this respect, Back (2008) states that the reference models help to systematize and make the process of product development more formal, besides integrating it to other business processes with the participants of the supply chain and final customers. For Romano (2003) the reference

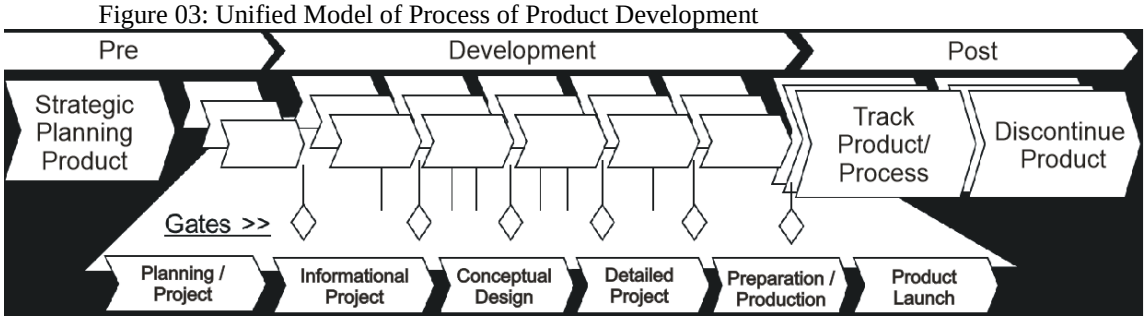
[2] "Involves product design with drawings, dimensional parameters, setting materials, etc." (Martins, 2004, p. 45).

models can represent processes of industrial sectors, serving as parameters for the companies in these segments to develop improvements in their processes and thereby establish a specific model.

Therefore, Rozenfeld et al. (2006) states that developing products consists of a set of activities through which is sought, from a market need and the possibilities and technological constraints, and considering the competitive strategies and company product, to reach the design specifications of a product and its production process, so that manufacturing is able to produce it. Still, according to Slack et al. (2002) and Toledo et al. (2008), from the perspective of organizations, "product development has a strong influence on other factors of competitive advantage, for example, cost, speed, delivery reliability and flexibility". Therefore, it stands out, according to Barros Filho (2003, p. 04), two visions related to product development. One where it should respond to "all the stages through which the product passes, from the identification of customers' needs to disposal of the product after its use". Another refers to "multidisciplinary, integration and concurrency" of the constituent activities of product development.

From these considerations, there is the reference model Rozenfeld et al. (2006), figure 03, representing in a unified and generally manner, all activities necessary for the management process and new product development. These are organized in macro phases, to ensure the completion of each related activity in a structured and integrated way.

Figure 03: Unified Model of Process of Product Development



Source: Rozenfeld et al. (2006)

The macro phase of pre-development is the development and definition of which products will be developed by the organization. From these assessments in developed the project scope through a macro planning of the project to be developed, containing all the information necessary for implementing it.

After that, the macro phase of development begins, and it develops through five stages:

It starts from the informational project, where all of the information set forth in the previous macro step is interpreted and translated into design requirements, in order to develop as a final result of this phase, the specifications of the product being developed.

From the definition of informational design, the conceptual design begins, the second stage of macro development. In this, it is sought to develop alternatives that can serve as a solution to the problem of the project undertaken and therefore this solution should be in accordance with the product specifications already laid down. This phase is characterized by the application of projective methodologies, in order to obtain better results for solving the project.

The third phase, called detailed design, seeks to transform the solutions developed in the previous step into technical requirements, preparing the product for production. At this stage the technical documentation is developed, the definition of the raw material used, the definition of suppliers, use test with the use of physical models, as well as the planning of the production process.

The fourth stage refers to preparation for the production, which seeks to put the product on the market, therefore, this phase is characterized by the development of manuals and personnel training.

Finishing the macro development phase, occurs the launch phase of the product, which seeks to logistical planning for product distribution, marketing characteristics, marketing and customer service, so that the product can be launched on the market.

The third macro phase, post-development, is divided in two phases: phase of accompanying the product, whose objective is to assess customer satisfaction, monitor product performance, review and evaluate the processes involved and document the knowledge acquired during the development of the project. The second phase, discontinue product, serves to evaluate and detect the end of product life, when it has no more economic and competitive advantages for the organization and thus effecting the termination of the project.

Rozenfeld et al. (2006) also highlights the support processes such as engineering change management, when there is need for changes in product and process developed for improving the process of product development, aiming to provide support for process change.

3. Conclusion

From the considerations set out above, it is highlighted the importance of the performance and design of the product as an essential tool for market differentiation and design of the product as an essential tool for market differentiation and increase of competitiveness for engineering organizations. Where they can compete not only by cost, but by differences based on innovative design solutions that add value to the product as quality and attractiveness (LIDEP/UFMG, 2011). Accordingly, the design ceases to be a creative individual act to be part and limited in an economic context from which it can no longer do without.

As Porter (1999), for a company to gain competitive advantage, it must adopt strategies to deal with existing competitive forces in the market, which the author ranks as: rivalry among competitors and entry of new competitors in the market, threat of substitute products, bargaining power of buyers and suppliers, focus on cost leadership, promotion of product differentiation and specialization in a particular market segment are generic strategies, i.e. , they are methods for dealing with competitive forces. Through these strategies, the design finds ways to incorporate in business practices.

The design, according Gimeno (2000), reduces costs, to the extent that its work is oriented to satisfaction of desires and needs requested by the client. But it is the product differentiation that design is configured as an instrument of fundamental importance, because this generic strategy also addresses the segmentation. According to Ferreira (2008) and Mazzini Junior (2010), the products absorb the subjectivity of symbolic values and communication design. Users of these products identify with symbolic references and become part of the social group consumption of a particular product and, while sharing a lifestyle, consumers determine market segmentation.

This hypothesis is corroborated by Rozenfeld et al. (2006), where he ensures that organizations should seek more than cost and technical performance. Aspects such as product quality in meeting the different requirements of customers, and the ability to manufacture desirable conditions ensure the competitiveness of the organization. According to the author, in addition to the gains in quality of product and process design, product development can enhance competitive advantages such as speed of delivery by designing products easier to produce and assemble, as well as reliability in meeting deadlines delivery through the planning processes of stable manufacturing, easier to implement and control.

Thus, according to Gomes and Passos (2011, p. 07), it is highlighted the importance of design for innovation[3] and participation of the professional or the design process. "This contribution extends the research stage with users and consumers prior to the project, to monitoring the product after its launch and possible discontinuity in the market".

To Gimeno (2000) the development of products must include the production processes in its entirety, having in the integration of design with engineering the rationalization of the production process.

Rozenfeld et al. (2006) states that the process of product development includes managerial and technical aspects in which an organization transforms market opportunities and information on possible techniques to be used in the production of a product. This process includes the design and

[3]" Innovation through design process should be a systemic approach, ie to consider all stages of the product or service in question design in the search for creative solutions projetuais" (DZIOBCZENSKI, 2011, p. 62).

development of a new product that is coherent with its life cycle, from planning and finishing up until the withdrawal of its purchase by consumers and its withdrawal from the market.

Therefore, according to Gomes and Passos (2011, p.07), from the interpretation of the definition of both ICSDI to the scope of the design, as for the characterization proposed by Rozenfeld et al. (2006) for the development of products, it can be noted that the two definitions deal with the life cycle of the product, "then one can assume that it will not lead to any kind of deviations using one of the terminologies".

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