

**Toward a Brazilian scale to measure performance by design management: two case studies**

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## **Resume of the lead presenter**

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## **Abstract**

This paper presents the preliminary steps to create a scale to measure design as a performance factor. Through an exploratory study consisting in theoretical and field research, the south Brazilian industry scenario is presented. The theoretical approach offers ways to bridge the gap of design as a competitive advantage discussion in Brazil showing how design effectiveness can be classified and measured. Two cases of successful design processes show its practical implications in the new scale development. Results illustrate that different approaches to the design process can lead to performance and points out that the measure being developed must present steps of design involvement and design management as a formal activity within an industry. The paper discusses the findings and the role of design in product development.

## **1. Introduction**

Design, as seen in many cases, is a major competitive advantage in team work, a creative tool, product improvement and, of course, a process. In Brazil, design is seen as a competitive advantage. More than one survey has pointed to design as a performance factor. However, none of these studies proves exactly how design can be profitable. In most cases, the managers interviewed point design out as the key to success in performance but fail to explain how. Unfortunately, foreign measurement scales and propositions are not applicable since Brazilian accounting laws are different from USA and Europe. The need for a Brazilian scale to measure design as a performance factor is therefore pertinent.

The authors' main goal in this research is initially to develop the first Brazilian scale. Divided in four phases, desk research and exploratory case studies, qualitative data collection and item generation, quantitative data collection and analysis, and validation, this research will present a measure of the role of design in performance. Through theoretical and exploratory research, this paper presents the

first phase of this work. Considering the south Brazilian scenario, some of the preliminary results of the desk research and exploratory case studies are presented.

First, an overview of design propositions is developed. This theoretical approach can offer ways to bridge the gap of design as a competitive advantage discussion in Brazil showing how design effectiveness can be classified and measured. Then, the paper presents two cases of successful design processes.

## **2. Method**

This paper presents the experiences of two companies in order to verify the reality of design in the south of Brazil. The cases presented here are part of a larger study which seeks to understand and measure the role and participation of design management in the performance of companies. This study was designed based on Churchill's paradigm, for the generation of new measurement scales, in which the first step is to delimit the construct which is being measured, to ensure the validity and reliability of what is being measured in this research.

The research presented in this paper is exploratory and qualitative, and it was developed in two stages: a review of the literature and two case studies. In desk research the theoretical approaches on design and its definitions, helped define concepts and delimit which can or not be used for the new measurement. The Brazilian theoretical approach was considered a way to adjust the parameters of the measure to local reality. Many practical questions emerged as the theoretical approach grew, such as the reality of industries and the practical daily use of design. To link those gaps, two case studies were developed through qualitative research performed through in-depth interviews and secondary data collection. Companies were selected by convenience as their design successes were the only parameter used to select them. Visits and interviews were developed using semi-structured scripts and secondary data were collected inside the companies and from public data available.

Data were processed by qualitative analysis in two completely different ways; design management is presented as the key factor for performance and market performance. One of the companies is client-oriented and in the other the wishes of the designer lead to value added products. Results are presented, discussed and compared to theoretical approaches as a way to develop scales.

### **3. Design as a process**

Throughout the 1970s, publications sought to put “design” or industrial design in context and define them. The texts by Maldonado (1993), Bürdek (1999) and Löbach are from this period. These authors have experience of the group that belonged (or was derived) from the School of Ulm. According to Löbach (2001) the profusion of observations on design in the media throughout this period confronted the public in general with an unexplained concept of design, which, by not clarifying their inter-relationships, relegated the concept of design to an understanding which was not always correct, especially as regards assigning excessive value to esthetics as a function of the process.

However, it was not only the consumer who had a mistaken perception of design. Other subject of the market, such as businessmen, engineers and people in industry often do not see the value of design (the process) and the designer (professional) in product development. From the theoretical perspective in which design is solving factors simultaneous by (REDIG, 1977), an idea which now current, but was probably beginning at the time of the publications, namely, that industrial design is a primarily collective, inter or transdisciplinary activity.

According to Maldonado (1993), design is to design objects projecting objects manufactured industrially, or by means of machines and in mass production. Even while remaining firm as to his definition, the author points out the difficulties in defining the profession based on the labor and

production process, since technological evolutions have, for instance, made it possible for a product considered industrial to not necessarily be mass produced, because of its value, or because it is rarely used.

Consistent with a more formalistic group, the definition of design could take into account only the esthetic form of the product, without considering the technical process for production. This definition is only useful when the products involved are consumer goods: however, it is unsustainable when the users' interest goes beyond merely formal issues. Maldonado's proposal (1993) establishes that it is the designer who develops his function within the production process, in order to 'substantiate the technical individual.' According to this definition, designing would mean to coordinate, articulate and integrate all factors which, in one way or another participate in the process of constituting the shape and the product.

Concerning the concept of design Löbach (2001) states that this "is the substantiation of an idea as a project or models, by construction and configuration, resulting in an industrial product that can be mass produced." In line with the author, both the process and its phases are design, at a total or partial level. The substantiation of an idea by 'corporifying' it and producing it is part of the concept of configuration, which comes from the German language "*gestaltung*" originally used to designate the profession before the adoption of the term design. Thus Industrial design is the process of adapting the products to be used, manufactured industrially, to the physical and psychological needs of the user or groups of users (LÖBACH, 2001, p.22).

Considering the restrictions inherent to production, Redig (1977) defines design as "the simultaneous solution of ergonomic, perceptive, anthropological, technological, economic and ecological factors in projecting elements and physical structures necessary for life, well-being and/or the culture of man." With this view, the author strengthens the strategic and planning characteristics of the profession.

Löbach (2001) defines that for the designer, the 'desirable attitude' would be to consider design as a "process of adaptation of the 'artificial' environment to the physical and psychological needs of men in society". However, given his commitments to industry or to whoever employs him, the designer can rarely adopt this position taking it for himself, ignoring the interests of the person who employs him. In this context, the design process presented by the author is considered all the way from the manufacturer to the consumer, inserting design in a production process aiming at consumption. In addition, it pays attention, as being theoretical, to the meaning of the industrial product in the process of its use, and to the observation of the evolution of industrial design throughout history.

Like all project activities that intervene in one way or another in the production and consumption relationship, industrial design acts as a true productive force which, besides everything else, contributes to organize the other productive forces with which it comes in touch. Thus, the issue of design method, or the steps that delimits the designer's work as a designer of a project is a fundamental part of the definition of design and its understanding as a discipline, theory or task within an organization. In this field, authors such as Löbach (2001), Bonsiepe (1978), Munari (1998) and Borja de Mozota (2003) propose the stages to be followed to obtain the best project solution. Besides defining the profession, the issue of method helps integrate the design in the context of industrial production which surrounds it and also characterizes it as a process.

When considering process as "a sequence of predefined activities executed in order to achieve a predetermined type or ensemble of solutions" (TALWAR, 1993 apud MÜLLER, 2003), which generates value for an internal or external client of the organization (HARRINGTON, 1993 apud MÜLLER, 2003), the basic characteristics of design are considered. Thus, design can be considered a process, especially as regards its methodological characteristic in product development, integrated with production.

Considering the definition of Rummler and Brache (1994 apud MÜLLER, 2003), design is both a primary process and a support process, because it both reaches the consumer and provides support for

production processes in the industries. It may also be punctual processes for the development of a specific product or continuous task of a team integrated to the product development processes of the company.

In a very specific view of the field of design, some authors also classify it as a process. Holt (1990 apud BORJA DE MOZOTA, 2003) identifies three types of design processes: analytic, iterative and visionary. In design as an analytic process there are few uncertainties, and the projects are basically the continuation of previous ones. In the iterative process of design, innovation is present and risk is considered medium. Differently, in the visionary processes, the project problem of design is not very clear, and innovation will be needed. However, in all alternatives, what determines the type of process is the predisposition of the company to risk.

Design as a process, according to Walsh (1992 apud BORJA DE MOZOTA, 2003) has four essential characteristics: (1) creativity, in creating something new; (2) complexity, since the task involves decisions in several parameters and variables; (3) commitment in solving multiple or conflicting requirements and (4) choice in seeking possible solutions at the different levels of the project involved. Independently of the view of the author, the idea of design as a process goes by the issue of method and insertion of the (professional) designer in the company or his systematic employment. Acting with the product development team, the designer can also manage this process.

There are many methodological proposals linked to the concept and practice of design, and various working facets of the designer and his team are presented. Even so, theoretical bases should be investigated in practical reality before developing the scale, as a way of verifying details and new perspectives. In order to explore the managerial practice and reality of design in companies in southern Brazil, below we present the experience of two companies.

#### **4. Two different approaches to design management**

Seeking to explore the matter of approach and use of design by Brazilian companies using as a criterion their clear success in design, a large and a small company agreed to participate in this stage of research and are presented below.

### **The case of Company A**

Founded over 30 years ago, in the interior of Rio Grande do Sul, Brazil, company A became the largest footwear manufacturer in the country. Today the company has several factories, with the most advanced plant for injected shoes in the world.

Working in the markets for adults, adolescents, children and infants, company A strictly controls its product, testing and evaluating all materials and components used to manufacture the products. Its products are exported to over 85 countries.

In terms of product design and development, Company A has one of the largest work teams in Brazil, 113 employees. For this study, the person responsible in general for the research and product development team, which is how this area is called in the company, was interviewed.

The designer who gave the interview entered Company A in 1984, with the mission of helping develop new products, since the plastic product produced at the time was already giving signs of going down in the market. Today the DPD (Departamento de Pesquisa e Desenvolvimento), the name given to the 'department of research and development' in Company A is responsible for designing practically all shoes produced from beginning to end. There are more than one hundred persons working in a three-storey building which is used exclusively by the team and very well guarded security-wise. This large team is responsible for all stages of project, ranging from the initial research to the prototypes.

According to the interviewee, design-related issues considered strategic at Company A, and they are closely related to innovation. Currently design is handled globally, and the result is due to the collective effort of the team. When he mentions the team, the designer is also referring to the company marketing team. According to the interviewee, at Company A the marketing, research and development and sales teams worked in close cooperation aiming at the same goals. The beginning of any project comes from the portfolio management team, which is generally proactive, looking at market opportunities, or even the internal ideas of the team. Market research is also used.

The idea is that the project will bring design closer to work, and no longer to the business, as used to happen previously in the company. This does not mean that the perspective of business and turnover is not important, on the contrary, but the important thing is to make the consumer/user understand what is being done more intuitively than by means of publicity and/or explanations. For this purpose, all projects have three main phases: conception, project and execution.

During the first stage, 'conception', the concepts connected to the project are developed. For this purpose, concepts of product and branding (brand management), analysis of market opportunities and of risks, as well as the company goals for the future product are studied. The use of the product and 'when to use it' are explained to provide a foundation for the project. In this preliminary stage, according to the designer, it is linked to the portfolio management and is closely based on the issues of performance of the product that is being developed. According to the interviewee, at this stage usually no drawings are used and the managerial tools are used according to the company culture. Once all preliminary studies have been performed the second stage is started.

In the phase called 'project', the key, according to the designer, is the prescription, the 'how' the product will be made. All the drawings are developed, from the simplest to the most sophisticated drawings and three-dimensional models, including technical drawings. In the project stage, the manufacturing specifications are detailed and the prototypes developed. The drawings of the molds needed are made available together with a "technical package" which is delivered to the factory.

The third product development stage at Company A is the so-called 'execution' (or implementation) and it basically covers production. The interviewee emphasizes that the results of production are again directed to the project team for new phases of conception. Although the interviewee did not mention this topic explicitly, the procedure is typical of organizational learning. When asked about this aspect, the designer mentions that certainly, even if in a natural, non-forced way, there is learning in the feedback from postproduction and product use.

After the three phases, the product is ready for the market and active production. For Company A, the results measured in the market are very important and eloquent: what sells well was well developed. The other important point is the time it takes to develop the product, i.e., time to market, which must be short, a few months, and which is compared to the sales volume to ensure to what extent the energy spent in development was valid.

The interviewee remarks that the process described is what is really done at Company A today, but that the process is always modified and aligned to respond better to market demands, and to demands of the strategic committee of the company, of which the R & D team is part. The product development process is fully documented and quite well organized. The interviewee believes that the typical documentation of this type of process is important and the standards are acceptable, but that flexibility is also very important.

It should also be clearly mentioned that the company board participates actively in the R & D team decisions, but also calls this team to participate in their decisions involving the product, forming an interesting partnership.

Finally, the designer commented that, besides several searches he has performed, simplicity is something that he would like to leverage in his team. In the interviewee's opinion, the projects have

become unnecessarily complex, and above all complicated. As to this, the team goal would be to seek to simplify the process, without, of course, losing the result.

### **The case of Company B.**

Founded 20 years ago, also in the interior of the state of Rio Grande do Sul, Company B began with the idea of a single product, a cutlery holder. The company now has 100 employees, more than 500 products manufactured and a turnover of more than US\$ 6 millions a year. It can be considered an “example of use of design”, since it has already received at least two important awards in this field: the *If*, the renowned German award, and the Premio Museu da Casa Brasileira (Museum of the Brazilian Home Award). Even so, its design process is unstructured, the company does not employ any professional in the field, and also does not apply the project methods that have already been validated.

In order to learn more about the company, an in-depth interview was done with the person in charge of production in the company. This person was present at the birth of the company, when the machines were purchased, and is today the main person in charge of production. During the conversation, the interviewee explained the ideas that guided the founding of the company, and guide work until the present time. As an organization, it is a simple company: one owner, one engineering consultant, and approximately 100 employees, around 10 of them working in the company office, in the commercial and sales area, responsible for product exports and also for promotional actions. The company also has a press department.

Working with products for the home, Company B is now the leader of its segment. Products for the table such as cutlery holders, salad bowls, serving dishes, tableware, cutlery and accessories, called ‘bridal list’ are developed for a select public that desires quality and beauty. The idea, according to the interviewee, is to work with quality materials, and reject the so called ‘cheap stuff’ in this field. Over the years, the company has developed at least three line of products with which is reaches the intended market (higher income class, known in Brazil as Class A)

The management of the cycle of life of the products is handled at Company B specifically oriented to each type of product or line. A few products are produced for many years, such as the first product made by the company, the cutlery holder. Other products are always produced, but their design is changed or updated, such as the ice buckets. According to the interviewee, it is not possible to not produce ice buckets, considering the market segment in which they work, but the project can be updated and offer modern, newer ice buckets. However, products such as toothpick holders have never been produced, because the company believes that they do not fit the profile of their customers. Also according to the interviewee, the market (and sales) movement is followed closely by the company, and when they notice that a product is selling less they analyze the decision to be taken about it.

It is interesting to see, considering the information given by the interviewee that Company B analyzes its market according to sales and not through research and, apparently, decisions are based much more on the owner's perception than on management tools. The interviewee mentions that the research is not used, because it shows people's perception reactively, and the company takes a proactive position.

The issue of communication is interesting at Company B. Its presence at trade fairs and in the best stores dealing with this industry, allows the target public to become acquainted with the products. According to the interviewee, the company chooses the stores where it wants to sell, and being close to at least one large retailer allows putting the whole line into the market. Even the stores that choose not to sell the whole line are encouraged to set up an exclusive space for the pieces, which must not be shown mixed with other products.

It is noted that there is great concern about the brand image, constructed, according to the interviewee, from collections with coordinated images and a lot of work directed at contemporary pieces. This concern about modernity is related to the wish to reach a young public with high purchasing power, with a traditional product that people only think about at the time they set up house or hold dinners, concerns which are not usual among younger people.

Generally, the product development process at Company B is simple and it can be internal or external. When it is internal, usually the company owner creates a concept and makes the first product drawings. The team (owner, engineer and another one or two employees from the commercial and promotion sectors) discuss the product concept and use. According to the interviewee, analysis of the competition (or synchronous analysis) is performed, but feeling is still the main guide to the project. The interviewee emphasizes that now the owner designs thinking about the production process, but that this used to be different, and it was the company's main problem: designing arts and crafts for mass production. Now that the production processes have been better defined, the designer/owner can already think directly about production. Even so, the next step is for the engineer to review it. He tidies things up in the project, preparing it for production. Then comes the project of the production process, including costs, in which production is planned and the tools chosen. Company B now has its own stamping and bathing technologies. Many of the tools are also developed in-house. Only glass, acrylic and packaging are produced by third parties.

The product development process is external to Company B, by decision of the company, in response to some specific line or to take the opportunity of having lines of products signed by famous designers or architects. The latter resource has proved very useful because it adds value (the designer's name) to the brand, and the company has already received awards for this. Thus, when it decides to use this modality of product development, Company B seeks out professionals, selects drawings and evaluates the possibilities of production. When the proposal is chosen, the designer works together with the Company B team.

Independently of being internal or external, the product development process at Company B must go fast. The company believes that with few steps the process is less rigid and more feasible, allowing the product to reach trade fairs, the main outlet for launches by Company B, in two months. Although it is an important factor, according to the interviewer, it is unusual for cost to kill a company project, since price is not the main attribute sought by the customer. On the other hand, the environmental aspect is

an important requirement. At the same time that there is little concern about discarding the product itself, since it is made to last decades, is made to last decades, is mostly made of recyclable material and is not considered a disposable product, the material and baths used for its production, do cause wastes. There is a specific treatment for the latter, and the company complies with environmental standards.

The product development process is not documented at Company B, differently from most large companies with a good turnover. The company also does not perform strategic planning, its concerns for the future and its plan are on a single piece of paper, and performance is sought with everyone's participation. According to the interviewee, the company is small and integrated, people love what they do, and the employees "enjoy" what they see produced. In fact the employees have already been taken to fairs to see what they produced exhibited. They believe that if the planning were documented, if they had a need for limits, a lot of the pleasure in the company would disappear. The interviewee cannot imagine that the company will grow further, he believes that the market divides and does not multiply. Certification is also not in the plans, and is considered an "own goal" by the company which prefer not to have any kind of traceability.

The design process at Company may be considered very simple or even non-existent as an organized structure, since it depends only on two persons and no formal method is used.

## **5. Discussion and Conclusion**

This paper presented the preliminary results of the qualitative exploratory stage of a research study which aims at developing a scale to measure the role of design in company performance. Through qualitative interviews two companies were assessed regarding their design processes and their strategic involvement through these.

The product development process from the viewpoint of administration and engineering has been studied, but rarely does the figure of the designer appear in these studies. Design is also not included openly in the processes.

For authors like Maldonado (1993), acknowledging the function of an industrial designer as a function that coordinates, integrates and articulates processes is to admit that this is not an autonomous activity, as his forerunners thought. Even though their choice appears free, they are always part of a context or system with strict priorities, which ultimately regulates the activity of the industrial designer. .

Likewise, the product development process could not exist without the product itself being modeled, with a shape and purpose. Even so, the participation of design in the product development processes and in the referential models is not explained. Few authors, Hein (1984), for instance, identify the designer's activity, implicit in the processes. Referential models of product development process, such as the Brazilian one of Rozenfeld (2006) mention the activities, but not the professional figure of the designer.

Analyzing the cases presented, this is one of the important questions: what is the role of design in companies? How can two companies achieve proportional successes in their markets, and in one of them there is no professional designer?

It might be thought that, possibly company B will have to review its position over the years, because its situation without a design team appears unsustainable as a competitive strategy. On the other hand, one might also say that the role of the designer, his skills, knowledge and attitudes are in both companies, i.e., by theoretical definition his competencies (skills, knowledge and attitudes) are present and visible (RUAS, 2005).

The second point to be analyzed in the cases is design as a process. In different ways, the process is present: in the sequence of tasks, in the desired output, in value generation (MÜLLER, 2003) and in

the predisposition to risk (BORJA DE MOZOTA, 2003). It is understood that not only the process and its extent, but also its output should constitute the scale. Thus, a dimension of a process should be explored and the design methods (theoretical) enter this dimension.

The strategic intension of the company regarding design is also an important factor and is related to process measure. Is the choice (strategic) of the company regarding design is by *managerial or strategic approach*? Will design be used to differentiate (as in Company B), coordinate (as in Company A) or transform

Finally, the general understanding of Design by the company requires concepts such as knowledge management, organizational learning, customer value, market orientation and innovation in the product development process. Inserted in the new scale, these items should be generated and can be sized. Figure 1 clearly shows the dimensions of the new scale, its sub-dimensions, and indicates the items to be generated to measure the role of design in company performance.

DIMENSION	SUB DIMENSION	ITEMS
<b>COMPETENCIES</b>	Knowledge	Who, with what sort of training, with what experience?
	Skills	Tooling
	Attitudes	Use of the method and understanding the strategy and of the organizational context.
<b>PROCESSES</b>	Problem Solving/Methods	Theoretical
	<i>Outputs</i>	Performance indicators
	Areas involved/people	The paths of design in the company
<b>STRATEGY</b>	Approach	Managerial or strategic
	Intention	Differentiation, coordination, transformation.
	Current situation	At what stage is the company really?

Figure 1 – Dimensions of the new scale

However, the future collection instruments still requires questions discussing the profile of the sample. Furthermore, the financial and accountancy items still have to be clarified for the performance dimension, and it is also necessary to go deeper into those dimensions in order to establish a broader model of the problem discussed here. Research seeking a scale to measure the role of design in company performance should continue by generating the items that are going to make up the scale and with the validation of the instrument by experts. The later application, refinement and validation should adopt Churchill's paradigm (1979).

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