

CONSIDERATIONS ON DESIGN MANAGEMENT OF FURNITURE MANUFACTURING COMPANIES IN SOUTHERN BRAZIL

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ABSTRACT

Managing design projects means to plan the new product development management and must involve knowledge on management, as well as of the design activities, to enable companies to become more competitive in the market. With a focus on the industrial sector, this study has aimed at understanding how the design management is performed in the furniture manufacturing industry in the Taquari Valley, in the South of Brazil, a productive segment that has a relevant prominence in the Brazilian transformation industry. Nevertheless, the companies in this segment lack studies to help them in design management. This study was based on the proposition by Borja de Mozota, according to whom, design management is inserted in the three organizational levels: operational, tactical and strategic. For the development of this study, we developed a research with a qualitative approach, characterized by a Case Study, for which the data collection took place on visits and interviews with managers of the two furniture manufacturers. The result of this study has shown that the researched companies deal with the question of design management at their organizational levels in an empirical manner.

Keywords: Design; Project Management; Design Management; Furniture.

1 INTRODUCTION

The Brazilian furniture industry is among the most important segments of the transformation industry in the country, both due to the importance of the value of its production and the generation of jobs in the national industry. In 2009, the Brazilian furniture industry consisted of 14.657 companies that generated 239 thousand jobs [1]. Consisting mainly of small companies characterized by their family management, design assumes an important role in the development of products for the primary sector, when we consider the aesthetic aspect as being the booster of furniture marketing. However, it is increasingly necessary that the companies understand and treat design in a more comprehensive manner.

The implementation of design management is a possibility, since design is a process used by the companies for the development of products, and is an important factor in the creation of industrial wealth [2]. In the 90s, design management acquires a strategic importance in the organization, and becomes a management tool. This factor changed the paradigm of management which, through design, aims at constantly improving products, processes and the company itself [3], in an attempt to be more competitive.

As regards Brazil, in 1995, the Ministry of Industrial Development and Foreign Trade created the Brazilian Design Program (PBD), with the goal of inserting and incrementing the design management in the national productive sectors. One of the activities of this program is to make the business community more sensitive toward using design as a competitiveness strategy. Nonetheless, according to the Brazilian National Confederation of Industries (CNI) [4], the country invests less than 1 % in research and development, which are activities that enable innovation in products and industrial processes. The development of products is prominent in the economy of organizations and nations, as it enables technological development and innovation [5], [6] and [7].

The performance of this research has also been motivated by the proposition that design contributes to the development of new products, but that not all organizations do yet understand its benefits [8] [9]. This aspect contemplates the interest in this investigation of one of the authors of the article that works in the furniture segment.

As research hypotheses it is inferred that design was recently incorporated to the product development activities and that companies conduct the design management process in an empirical manner. Based on this contextualization, the goal of this study is to understand how design management is performed at the companies of the furniture segment in the south of Brazil, the second largest furniture producing and exporting center in the country.

2 THEORETICAL FRAMEWORK

Design is a process that has four essential characteristics: creativity, complexity, commitment and choice [3]. In the understanding of the author, this implies the management of integration and design within the company at the three organizational levels: operational (action), tactical (coordination) and strategic (vision). She classifies each level with its assignments, as detailed below:

- Operational level (action design): this level represents design as a differentiating factor. According to the author, at the operational level, design is considered an instrument to differentiate the aesthetic aspect of a product or service. It refers to the determination of briefing the project to be developed. Therefore, “design is present within the product from the definition of its physical characteristics: it cannot be subsequently inserted, as an accessory” [3], i.e., design is already present at the conception of the product. In this sense, design can improve the product and its performance.
- Tactical level (coordination design): at this level, design is presented as a coordinating factor of activities involving brand name, production, technology, information and innovation in the development of products. At this level, design becomes a process that integrates with other processes within the company, such as innovation and technology management [3].
- Strategic level (vision design): this level presents design as a factor of transformation and manages the connection between design, identity and organizational culture, making the knowledge and competencies of design penetrate into the strategic process of the company, in the construction of reality [3].

The importance of design management is reiterated by several authors by highlighting innovation centered on design [10] and the improvement in the performance of the companies [11] [12]. Design management is considered strategic as it attributes aesthetic elements and elements of quality and value to the products; provides identity and strengthens brand names, materializes corporate cultures and may act in the reduction of production complexity, time and cost [13].

In the same sense [14], when approaching simultaneous engineering it is considered to have a great impact on the creation process and on the manner in which the product development project is developed. It explains that the integrated development of the product uses a methodology aiming at organizing processes, obtaining customer satisfaction and improving the productivity of the companies.

Best [15] also highlights that the economical importance of design gains always more distinction in the organizations as it contributes to the business in a global manner, as a tool for innovation and change. In design management, people management, project management and management of processes and production is performed in the conception of new products and services.

3 RESEARCH METHOD

As a research strategy, we have made a Case Study, with a qualitative approach. Initially, we realized the need of knowing the object of study. We then carried out an exploratory study, and obtained a general view of the industries located in this region, in order to proceed with the selection of cases that were subsequently analyzed in-depth.

Among the companies of this furniture manufacturing center, the criterion for choosing the two manufacturers for the Case Study was: that the manufacturer had to be associated with Association of Furniture Manufacturers of Rio Grande do Sul (MOVERGS), an entity that congregates the companies of this sector in Rio Grande do Sul, the use of the term design in corporate communication; the existence of an easily identifiable product development process; the availability of the company to participate in the research.

In this research we searched for evidence, at primary sources, through directed and perceptive interviews [16]; and at secondary sources, doing research at the manufacturers' website; in direct

observation, things that deal with reality and are contextual; in physical artifacts that allow the perception of cultural aspects and technical operations.

For the interview with the managers of the Case Study companies, we used a structure itinerary, which had as a technical support the proposition that in design management, design falls within the three organizational levels: operational, tactical and strategic [3]. Following the definitions and characterization of the levels by the author for each one of them, these questions were presented, both open and closed, so that the evidence of the practices used in the management of design projects would be reported by the managers.

The analysis and data interpretation strategy for the Case Study was based on a description of the two cases, individually. Next, we created categories for analysis and the content was arranged within each category in a descriptive and analytical manner.

4 CASE STUDIES

The two Case Study companies are characterized for being small family-owned and operated companies whose organizational structure is functional as it is divided into criteria defined by functions [17] and, in this type of structure, project management supports the development of products and their management practices [18].

4.1 Case Study 1 – Company A

The furniture manufacturer A is a customized furniture producing company that has been active on the market for 17 years. It was born out of the interest of two partners in creating a business in the furniture area. By joining the knowledge in sales of one of the partners, which at that time was manager of an electric appliances store in the town, to the knowledge in the profession of carpenter of the other partner, who was unhappy at his job, they gave origin to a new entrepreneurship. The company grew and today has 44 employees.

At this company, evidence of training is represented by school-type desks arranged for meetings. Boards with goals (daily, weekly and monthly) and indications of production are exhibited for the knowledge of everyone. We have also found a clean and organized production system, with indicator boards of each production sector. The production flow is easily understood.

Restricting its activities to the state of Rio Grande do Sul, the company has three show rooms with their own brand name. The company defines these spaces as "showroom of our production capacity and the possibilities of available raw materials", instead of sales locations as such. In them, professionals or architecture students are the designers-salespeople that try to meet the needs of the customers. Reports demonstrate the knowledge of the needs and characteristics of the markets in which they are active.

According to the data obtained in the interviews, "the type of management is participatory", i.e., the employees also participate in decision-making, which is "at the same time, planned and focused." This corroborates the reports that the company provides all employees with the possibility to visit the International Trade Fair of Machines, Raw Materials and Accessories for the Furniture Industry (FIMMA), the largest trade fair in Latin America for the wood and furniture production chain that takes place every year in the city of Bento Gonçalves, RS.

Regarding process improvement, the company carries out what they call "creativity meetings". At these meeting, in addition to bringing a lecturer to motivate and propose new ideas for the company, every sector shows "what they do" to the remaining colleagues. With this, everyone ends up knowing the whole development and production process. According to management, this contributes toward the improvement in production processes, since "by knowing what others do, and their needs, it is possible to work in a different manner and to improve, by obtaining a better product quality".

Another aspect that confirms entrepreneurship is the new project of the company that is at the implementation stage, whose goal is to start serial production of some items, such as, for example, wooden buckets, for which the company has perceived a market potential.

They manage to administrate product development in a global manner: prospecting (they invite possible customers to get acquainted with the company); they train their designers-salespeople to better understand what the customer wants; they participate at events of the sector and in projects with building companies; they know the markets where they are active (they describe behavioral characteristics of each region); they execute customers' orders according to the possibilities of the production process of the company, and they care for the environment and employees, logistics (they

make deliveries themselves) and service rendering. Figure 1 shows a product developed by Company A.



Figure 1. Example of a product of Company A

5.2 Case Study 2 – Company B

Company B was founded in 1948. It is a family-owned company that is in its third generation, and the wood manufacturing tradition accompanies the organization since its origin. The founder of the company was a wood sculptor graduated at the Arts School of Cologne (Köln), in Germany, who had moved to Brazil, and decided to open the furniture company in the Taquari Valley.

In the 60s and 70s, under the command of the founder's son, who had graduated as master carpenter in Vienna, Austria, the company grew and become recognized for the quality of their products and the art of classical pieces of furniture. Today it is still one of the most important wooden furniture factories in Brazil. The furniture produced by this company goes through generations and is manufactured with noble wood of certified origin.

According to the manager, if a grandchild inherits the furniture of their grandparent, and if a piece is damaged, the company has many moulds of products that were produced decades ago, and is able to reproduce it. The interviewee reports this fact with emotion and tells us that “over the years the company has lived along with changes in styles, tastes, and beauty standards in society”, and that, in spite of adapting to new technologies and raw materials, they have tried to maintain the identity and the quality standard. As one of the managers points out: “we try to stay tuned with the new needs and behavior of the market, based on the identity and customization, in every product, we search for the best equation between shape, function and emotion”.

Presently the company has 52 employees and sells in the whole Brazilian market. Every five years they carry out an external research to measure the satisfaction of their customers. They carry out interview with customers and prospects in the Morumbi and Moema districts in the city of São Paulo, as that is where traditional customers of the company are located. One of the managers poses that: “the age group of our customer consists of people that are 50 years old, who look for a classical product. They are not concerned with fashion, but look for other attributes such as quality, refinement, identity”. These reports confirm knowledge of the market they are active in, a fundamental aspect of the identity with their customers.

They have two show rooms with their own brand name. They work in partnership with architects for the development of customized projects. In addition to serial customized products, they do corporate projects for hotels, restaurants, residential and commercial buildings.

Consciousness of environmental protection also stands out, as the company uses certified wood and wooden panels, instead of massive wood, on their products, which are finished in lacquer, for

example. They use Brazilian technical standards for designing chairs and tables. Figure 2 show a product developed and produced by Company B.



Figure 2 Example of a product of Company B

5 ANALYSIS AND INTERPRETATION OF THE DATA

The analysis and interpretation of data is based on the background research of Borja de Mozota that cut out of theory aspects found in the investigated reality. Design is as much a creative process as a management process [3]. The categories of this research focused on design management dealing with design as an action (operational level), design as a function (tactical level) and design as a vision (strategic level).

5.1 Design as action

Design as an action is at the operational level and deals with aspects of product differentiation and the actions performed by the company in order to communicate with the market. “In the world influenced by mass media, consumers wish to differentiate themselves by looking for life styles based on affirmations of themselves and by differentiating themselves from the masses” [3].

As to the differentiation in the aesthetic aspect, the products of Company A follow the trend of straight lines, formal simplicity and a clean visual aspect. The product is characterized by a contemporary style. They use functional and modern accessories and try to add value to their products.

Regarding definition of the product briefing, Company A, which is oriented toward the customer, has the collaboration of architects and the participation of the company's internal team in the identification of production viability. Therefore, the creation is a sum of competencies of their employees, but with a focus on the requirements of a specific customer.

Regarding communication with the market, for Company A, the concept that they want to communicate to the market on their products is in the three show rooms that carry their brand name. According to the manager, “the communication reference of the show rooms is sophistication, modernity, technology and functionality”. With a focus on customized production, they have no product catalog, but do have folders with images of some projects they have carried out. They have a website on the Internet, carry media on radio, newspapers and magazines specializing in decoration, to advertise the company concept. They carry out prospecting by inviting customers and future customers to get acquainted with the company structures. Company A has as a slogan: Freedom of shapes, which “means that the customer is free to choose or create the piece of furniture they wish, with different materials and finishing”.

The products of Company B have more details as an aesthetic characteristic, with an elaborate visual aspect. The classical style identifies the product. They follow a hand-crafted production process.

Another differentiating factor of the product is the raw material they use. Company A uses MDF panels. Company B basically uses certified wood.

At Company B, a committee defines the project briefing, which is tested (on the prototype) to be presented to the market. When we analyze this aspect, we can infer that Company B has more control over what they are going to offer to the market than Company A, whose references are focused on the needs of a unique customer and on the knowledge of the external partner (the architect), since products are produced in a customized manner. The fact that Company B defines which products it is going to create for the market, it grants more opportunity for a higher innovation power and also a higher risk of acceptance of the product, even when they do research on what is on the market and observe the trends. In this sense, a new concept of innovation centered on design and not only on innovation originating from the technological or market progress [10].

Company B announces their products to the market “through meetings, on the website and at customer service”. The company has two own stores which is also a way of communicating with their customers. The slogan “from generation to generation” confirms the status of a product of quality, durable, that uses certified hard wood and an excellent finishing, and, as the manager completes, “our pieces of furniture last through the times”. As to the characteristics of the products produced by the company, the manager pointed out that “we manufacture pieces of furniture that meet the wishes of people based on the accelerated rhythm of life. Our pieces of furniture are used by the people in the few hours of social interaction and in the best way possible”. In this positioning of the manager one notices a sense for the piece of furniture that goes beyond its commercial value (buying and selling), that of the meaning of well-being that this industrial object can provide. Table 1 shows the comparative synthesis of this category.

Table 1. Category comparison - Design as action: operational level. Source: the researchers

Design as action	Company A	Company B
1. What differentiates the product (visual aspect)	Formal simplicity	Detailed
2. Product style	Contemporary	Classical
3. Meaning of product	Innovation	Tradition / memory
4. Briefing	Define with the customer	Proposed by a committee
5. Slogan	"Freedom of shapes"	"From generation to generation"
6. Communication with the market	Show room, media, prospecting	Meeting, website, service
7. Aspects valued in the image of the company	Quality, customer and employee satisfaction	Quality, tradition and care for the environment

5.2 Design as coordination (function)

Design as coordination is at the tactical level that deals with the aspects of coordination of design activities within the organization, with the contribution of design to product development and the question of innovation and technology. This aspect also considers the existence of a space for decision-making on design, thus disseminating the design culture over the whole company, and a know-how, a knowledge of their own [3].

The project is configured as a very important aspect for product development as, in the drawing, one finds solutions that help understand the concept and the construction of the product. Regarding this fact, the two researched companies use specific software for projects. Company a carries out their project in AutoCAD and Promob and Company B uses Solid Works for this function.

Regarding the contribution of design to product development, Company A argued that “it is vital, since it develops differentiated products and value-added products. “The cost of a product is relative. The important thing is the symbolic value, the reference value for those who acquire the product”. This quotation informs that design makes innovate the meaning that people attribute to products, aggregating value to them, where value is not only in the product, but in what it represents to those who acquire it [10].

For Company A, in their design activities, “the reading of the project and the transformation into production processes causes the whole process to become organized. By eliminating bottlenecks, the

production sequence follows a flow that better organizes productivity”. Hence design also contributes to the organization of the production process.

When projects of the parts of the piece of furniture are carried out with all specifications required by the customer, and identity with a bar code label is created, that indicates the type of part, the material and the finishing (pattern and color). This identification goes through all stages of the production process, and, along with the project, follows the product in the packaging that will be delivered to the customer.

Regarding innovation, Company A has confirmed that they try to innovate in their products. This is perceived “in the design of the products, in the raw materials used, in the machinery, in logistics, in the rendering of services”. Contact with suppliers is considered a source of information for the development of new products, where “in integrated management of innovation, the supplier is also co-responsible for the project” [3].

At Company B, regarding the production processes, the manager reported that the training process of a carpenter may take approximately ten years. “It is necessary for the carpenter to learn the differences between woods, the details, the proportion, the harmony of shapes of what he produces. Carpentry is an art, and the company's customers are demanding”, the manager concludes. The manager pointed out that design “has brought the possibility to differentiate in the use of materials, straws and pullers”. In the coordination of the activities, Company B uses technical production record cards that, according to the manager, “are the curriculum of the product”, containing all information necessary for the production of the product. They use Solid Works software, which shows the drawing of the parts “so that the details are understood”.

Company B also confirmed they accept challenges of innovative projects, required by architects or designers. According to the manager, “these are experiences that are later aggregated to other projects”. Under this aspect, design is a dynamic process of adaptation and transformation of past knowledge that are adapted to the requirements of the present [3]. The concept of design also stands out as a triggering factor of emotions that increasingly is in the agenda of debates on design. People do not buy products, but meanings [10].

This category refers to the aspects of coordination of the activities of the production process in which design fits in. In Table 2, it is possible to view how this is carried out in each of the researched factories.

Table 2. Category comparison - Design as coordination: tactical level. Source: the researchers

Design as function	Company A	Company B
1. They use project software	AutoCAD	Solid Works
2. Creation	Customer+architect+ company	Research+company
3. Contribution from design	Organizes production processes Adds value to the product	Differentiation, efficiency
4. Know how	Recent, under construction	Passes from generation to generation
5. Orientation of the production activities	Bar code and project	Technical production record card: it is the "curriculum of the product"
6. How they innovate	Raw material, production process and in service	Raw material
7. Relationship with suppliers	Source of information for product development	Partners in product development

5.3 Design as vision

The design as vision is at the strategic level and we have considered: the time for which design has been incorporated to the development of products of the company, the design as a strategic and competitiveness factor, the existence of a strategy for the development of products and the mission of the company.

At Company A, design was incorporated in the development of products due to the need to participate in the market. The company considers design as a strategic factor and an important element of competitive differential. “It renders the product competitive. People want a unique product. It promotes the satisfaction of the manufacturer and the customer”.

They consider that “the investment in design is smaller than the return that is possible to obtain with its implementation in the development of products. This means that the value added to the product with the use of design brings a higher financial return”.

The company has as a mission: “to be the solution to the needs of customers in the furniture sector, to grow as a company through commitment of our employees, generating profit to invest in technology and improvement, making our product practical and competitive”. Based on what has been exposed during the interview, we consider that the company has a systemic view of the product and the market they are active in. The company tries to innovate, to be different and to offer service to their customers.

At Company B, one notices that design has always been present. Product development is oriented by the tradition of furniture manufacturing and by the cultural orientation of the founder. The considerations of the manager contemplate this aspect. “Ever since the first years (of the company) there has always been a concern when reflecting and analyzing the repertoire (of furniture). The founder was a man with academic graduation, both in construction and in art. Also, those who continue (with the company), over the years, remain with the determination to interpret the European creations in the light of modernity, trying to expand our look to much beyond the micro-trend. We try to stay tuned with the new needs and behaviors of the market, based on identity and customization. In every product, we search for the best equation between shape, function and emotion”.

Company B also considers design a strategic factor and one perceives that design has always served as a guide for the development of their products. The manager considers that the design practiced by the company is strategic, since “we create and develop products that accompany the needs of society”.

The mission of Company B is: respect for the delivery deadline, for the environment and the wood, honesty in the generation of results, integrity in all our services. In addition, they always make efforts to make the best possible product and finishing. According to the manager, “these values govern our actions and sustain our motto; (a company) from generation to generation. They assure the continuity and sustainability of our business, and our long-term relationship with customers, suppliers and the community in general”.

The identity of the organization is based on several representations that are mental images associated to the organization and that the consumer recognizes and distinguishes from the others [3]. Table 3 shows a few aspects of the design category with a transformation role, at the strategic level.

Table 3. Category comparison - Design as vision: strategic level. Source: the researchers

Design as function	Company A	Company B
1. Strategic planning	Done	Not done
2. What is the strategy? product/technology/ brand name/ market	Market	Product technology
3. Design management	Acquired	Innate
4. Identity	Under construction Follows what exists on the market	Recognized
5. Knowledge and competencies	Creativity meeting Exchange of knowledge	Long learning time Perceive the raw material and the harmony of the piece of furniture
6. Mission	Defined	Defined
7. Design is strategic	Yes	Yes

The data demonstrate that each company has its own strategy: one tries to translate concepts of contemporariness, with technology, new materials; the other is involved in tradition, and rescues a part of the history of people (through objects), the memory and the knowledge. Both are shaping themselves, since industries are living organisms that adapt to the environment in which they are inserted, to stay on the market.

5 CONCLUSIONS

Design has become a strategic factor for the companies to become more competitive, thus increasing the importance of knowledge in project planning and management [3]. However, it can be noticed that, for those cases studied, it is necessary to better develop this subject, first of all due to the lack of knowledge of the concepts of project management by the organizations.

It was noticed that, in spite of the fact that there is no formalization of these concepts, both companies researched in-depth are sensitive as to the use of design for the development of their products and consider it a strategic factor that aggregates value to the products. This favors the exchange process between the industry and the market, providing gains to both [19]. However, propositions approaching the integrated development of the product [14] highlight the importance of the conception and development of products in a systematic manner with the use of a methodology, thus enabling higher efficiency in the actions of the companies.

At to the integration of design in the three organizational levels of the companies [3] and [15], has evidence that for the two companies, design has a great importance in the development of their products, even though in an empirical manner.

At the operational level, that of design as action, the companies have their own characteristics that identify them, both for the products they make and for the communication with their markets of activity. One company has a contemporary visual aspect, and uses automated machinery in their production process. The other is characterized by a classical style, in which the art of carpentry prevails and the knowledge to do it in a handcraft style is present in the product.

At the tactical level, of design as function, each one of the companies has a particular procedure, even if only informal, to receive the “problem” from the customer and to decode it and present the solution: the product. They consider each new project as a challenge in which learning occurs that serves as experience for future works.

At the strategic level, of design as a vision, we noticed that Company A has found in design the strategy to conquer new markets. Focused on the customer, they try to ally management knowledge with the design activity, through customer demand analysis, on the customized products they manufacture, as well as in the creation of an own line of products in search for innovation. At Company B, design is present since the origin, through the initiatives of its founder. The company has lived with changes in behavior of society, changes in consumers' tastes, new raw materials and technology. It went on adapting itself to the changes and works to maintain its space in the competitive market it is active in.

One has perceived that the implementation of modern management practices occur more clearly at Company B. This is possibly due to the fact that the manager has recently concluded a university course in management. As reiterated by [3], regarding the integration of design into the corporate environment, it is up to the managers to understand more on design, and up to the designers to understand more on management. The getting-together of these two activities promotes the management of design in a much more effective and efficient manner.

With this work we have pursued to evidence the importance of design for the development of products of the organizations if the furniture sector, that interferes so much in the organization of processes of the company, in their communication with the market and in meeting the needs of the consumers.

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