STUDY ON THE INTRODUCTION OF DESIGN MANAGEMENT IN THE PRODUCT DEVELOPMENT PROCESS OF BRAZILIAN CLOTHING COMPANIES

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ABSTRACT
The goal of this research is to study the introduction of design management in the product development process of Brazilian clothing companies. The theoretical framework of this research shows that the curricular programs of the Schools of Design in Brazil do not yet emphasize management sufficiently in their courses, making it improbable that designers will develop managerial abilities. The principal objective of the present study is to analyze how the clothing companies in Araranguá, in the state of Santa Catarina – Brazil, introduce design in their processes. The analysis was carried out via a comparison with the Design Management Model presented by the authors Bruce; Cooper and Vazquez and used as a guiding element for this research. The sample encompasses five companies that are developers of fashion products. Qualitative data analysis of their structure and operation resulted in suggestions for improvement for each company studied.

Keywords: Fashion Companies, Design Management, Fashion Design

1 INTRODUCTION
The etymology of the word design and its metamorphic applications in modern English demonstrate that the meaning of the word encompasses not only creativity and innovation but planning, process, and execution as well. One way of integrating the goals of a company into the product development process is through design management.

That term has been used, in general, by business managers to describe an approach, for the solution of problems characteristic of design that aims at valuing the concept, the project and the aesthetics. This represents the insertion of a design culture into a company [1],[2],[3]. In view of this context, design management assumes fundamental importance and for that reason is the topic of this study.

On the European continent government contributes strongly toward the dissemination of design concepts with the goal of improving the competitive performance of the companies there [4]. Studies by [5] carried out in the European Union present a model of design management that emphasizes the importance of three elements: briefing, sourcing and evaluating design. The research done by those authors will be used in this study for a comparative analysis of companies of the clothing sector as well as an analysis of the methodology's application in those companies. This sector stands out in its national and international scope, since Brazil is presently the sixth largest manufacturer of textiles in the world producing 8.2 billion pieces of clothing per year [6].

Hence, this research becomes even more relevant, in that it diagnoses what takes place in the reality of these small Brazilian companies. The sample selected includes only a small number of companies, and it is recommended that this sampling be expanded, both in the region studied and beyond because it shows qualitative data and is therefore capable of revealing information valuable both for scientific research and for the studied region, thereby making possible improvements regarding Design Management.

In Brazil, the clothing manufacturer segment of industry is characterized by the predominance of micro to small-sized companies that in the majority of cases have an organizational structure based on family management, which is informal and intuitive. This may jeopardize their effectiveness and in this way they become less competitive in the market [7]. Confronted with this issue, we propose answering the following research questions:

- How do Brazilian small clothing companies use design management?
- How can effective design management render the small clothing companies studied more

competitive?

2 INTRODUCTION OF DESIGN IN EUROPEAN COMPANIES

Recent studies have shown that the effective use of design is fundamental for the creation of new products, processes and services. Good design may significantly aggregate value of products, lead to growth in sales and the exploration of new markets, as well as consolidating existing ones. A study carried out by the European government has analyzed a sample of two hundred projects at small European companies that received a subsidy from the government to engage the services of professional designers for a series of activities in the development of new products. The study identified that the major causes for failure of a design project include lack of commitment by project top management; low funding for project financing, insufficient funds to cover costs and inadequate application of design competencies [5], [4], [9].

In this study, design management analysis of small companies evaluated three primary factors: sourcing, briefing and evaluation. Sourcing refers to the acquisition of the design ability appropriate for the creation and implementation of new products, as well as for the development of a corporate identity [10].Briefing is an important stage for designers, since it contains a great deal of information oriented toward producing an effective solution for the customer. Designers need to have information on marketing, such as target-public, pricing, goals underlying the proposed design, details about production mode, as well as plans and a chronogram for execution [11]. Evaluation involves assessing the concept with regard to briefing; as well as market design and success analysis measured by criteria such as: sales performance, increase of awareness of the service, and equilibrium points, among others.

The model presented by [5] highlights the critical points of the process and shows how to explore design management in small companies using the stages sourcing, briefing and evaluation. Based on the Design Management Model created by the European authors, Bruce, Cooper and Vasquez, the authors of the present research have pursued to perform a comparison through the model developed by the previously referenced authors. The model presents the following sequence:

- Trigger for action: preparation of the gross concept, the customer factors, technology boosting factors, competitive factors, strategic management factors, market analysis proactive factors, cost factors, and consumer needs.
- Evaluated concept: is equivalent to problem resolution or opportunity analysis. It includes investigation and analysis of information collected during the previous stage. A final report is prepared for the customer, as well as a project schedule [12].
- Concept development: after the identification of the needs, simple sketches are quickly prepared to express ideas and evaluate possibilities. It is necessary to have several points of view at this stage, as this is the learning and study stage for development of the product [12], [13].
- Sourcing: is the search for external help from organizations when hiring professional designers.
- Briefing: involves two stages: the confirmation of briefing in which design is audited after which the project manager defines launching dates identifying production and distribution channels. The final briefing is approved or disapproved during the second stage.
- Mock up: involves two stages: the initial version of a product that is being developed before marketing and the testing and planning stage with three-dimensional models. In the second stage, the version of the product has undergone the necessary reformulations and reevaluations and is used to generate the prototype.
- Experimental production: is represented by multidisciplinary work between engineering, marketing, designer, factory, and salespeople. The result is a complete specification and detailing of the product with technical drawings, colors, materials, types of finishing, dimensions, and measurements. Withdrawal of product from the market: evaluates the withdrawal process of the product
- Complete production: serial production of the product. Represents design management at the operational level.
- Launching: consists of promoting and evaluating the launching.

3 RESEARCH METHOD

This research is defined as exploratory and will not present statistical indicators, but rather will carry out a qualitative mapping of the real situation of the companies studied through a comparative analysis using the model proposed by [5].

Multiple case studies were used as a research strategy to identify the way in which Brazilian companies introduce design management in their processes. A case study is an empirical study that investigates a contemporary phenomenon in its real-life context [14]. The strategy of qualitatively analyzing the companies in different scenarios was selected after a few meetings with business people of the clothing industry in the region that revealed dissatisfaction with the performance of the companies in the market.

The research was carried out in three stages. The goal of the first stage was to prepare a semi-structured interview to collect data on the variables. The questions considered the following variables: briefing, sourcing, evaluating, design and design management. The content of the interview was formulated with the help of the Design Atlas Questionnaire, a tool developed by the Design Council (UK) to analyze the capacity for design within a business [21]. The Design Atlas served as a support tool for the preparation of the interviews and was not applied. The second stage was data collection from the companies. In the third stage, after the interview, we performed data transcription; subsequently the items of information were separated by affinity and listed in a summary chart for use in the Case Study.

4 COMPANIES STUDIED

The clothing industry has great importance in the Brazilian economy since it moves billions and creates jobs easy to access. According to Geni Ribeiro [6], Product and Market Consultant of the Brazilian Association of the Textile and Clothing Industry (ABIT), fashion is the second largest market that exists in Brazil. There are 30 thousand companies, with 1.7 million direct jobs that generate 2.4 billion U.S. dollars in exports. The sector has been facing difficulties due to the impacts generated by the growing competitiveness of the market, with the introduction of new technologies, imported products, demanding customers and a shorter life cycle of the products. In spite of the fact that it is a participatory sector, economically speaking, it has suffered from the adaptations required by the market. These are relevant indicators, since the majority of these companies are micro, small or medium-sized and are probably going through managerial problems or through implementation of management processes related to these changes.

All the companies studied are active in the clothing sector, are characterized as small-sized companies and as developing fashion products in the fast-fashion segment. They are located in the city of Araranguá, in the state of Santa Catarina, Brazil. To protect the data of the participating companies, they are represented by letters: Company A, Company B, Company C, Company D and Company E, preventing identification of specific companies. The profile of the companies is presented in a summary manner in table 1.

Table 1. Profile of the studied companies

Companies profile	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E
Number of Employees	21	16	29	55	39
Market Value	R$ 750.000,00	R$ 850.000,00	The company didn´t answer	R$ 8.000.000,00	The company didn´t answer
Annual turnover	R$ 1.800.000,00	R$ 1.500.000,00		R$ 4.000.000,00	

Regarding design, the companies studied express different contexts and understandings. In order to map the company profile, some pieces of information are necessary, such as, for example: what do companies understand by design, at what level do they work on the fashion trends, if they have a clearly defined public, as well as the ways of distribution. In table 2, it is possible to view how each company positions itself regarding design.

Table 2. Profile of the studied companies related to Design

COMPANIES PROFILE	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E
Concept of Design	Style, creation	Innovation, novelty, visual aspect, aesthetics	New	Format, mould	Composition of ready piece
Level of trends	Mass media	Mass media	Mass media	Mass media	Mass media
Design: cost or investment?	Cost	Investment	Cost	Investment	Investment
Does it have defined target public?	No	No	No	Partly	Partly

It is relevant to clarify that fashion trends travel a long way until they become accessible. So, the phenomenon of fashion goes through the stages of launching, acceptance, copy, massification and wear out.

5 ANALYSIS OF RESULTS

This analysis presents the answers collected regarding variables such as briefing, sourcing, evaluating, design and design management. In accord with the main goals of this study, analysis of the results has the purpose of grouping pieces of information, analyzing them and comparing them to permit recognition of possible similarities and differences between the studied companies. Viewing the table 3 that presents a synthesis of data allows a better perception of the scenario studied.

Table 3. Compilation of the results obtained in the research

VARIABLES About Design Management	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E
What do you understand by Design Management?	It is the records	Planning, control and management	Unable to answer	Unable to answer	What sells and what does not sell
Do you have a Strategic Plan?	No	No	Yes	Yes	No
What is the added value of the products?	Customized trims and materials for sewing	The part model and the quality	Quality	Structure of clothing and quality	Modeling, design and quality
Do you outsource services?	Yes	Yes	Yes	Yes	Yes

5.1 Introduction of Design in fashion projects

Regarding the concept of the term design, all studied companies associated the meaning with product aesthetics and innovation. However, none of them mentioned design as a strategic tool or a competitive factor.

As to the target public, none of the companies presented a clear definition of the public they serve. It is worth noting that; the more comprehensive the focus on the profile of the consumer, the more difficult it is to establish a concept of brand name and product. Conceptual brand names generally have a specific customer focus established through research of behavior, anticipated identification of consumer requirements and, above all, the acquisition of customers who are trend setters in anticipation of mass media campaigns..

At the launching fashion show of regional brands one can observe a similarity between the models of one brand and another. This happens because the research sources they use are the same, such as open websites of international and national brands, paid websites, trade fairs, international trips via showcase pictures of major brands, lectures on micro trends made by the fabric supplier, international

magazines and soap operas on the Globo network. All companies studied use these research sources as a basis for their product development. So, one notices that these companies work with the trends on a mass media level, a stage in which varied publics adapt to the same trends that are already on the streets. [15], [16], [17].

This fashion forecasting is done by professionals that work with fashion forecast. These specialists in market research and analysis sell financial services and illustrated reports to manufacturers. These are forecasts built on exhaustive statistical research designed to measure the relative popularity of colors, fabrics, shapes, trims and materials for sewing and details. Others who also identify these demands are the cool hunters (trend hunters) who have a sensitivity for identifying trends in their initial stages and predicting which products may be appropriate for them. These companies produce style books and specifications on the major emerging styles with suggestions for the next season. This is why it becomes so difficult to develop something totally new to fashion products. So, it is easy to understand that the similarities between the companies and products is not mere coincidence, but rather a consequence of this whole process of identifying and disseminating trends. This however, in no way justifies copies, lack of creativity and lack of definition of a specific target public [15].

At two companies in the study, design was regarded as cost and at the other three companies it was regarded as investment. Elaborate and personalized details increase the cost of production processes. Hence, the added value attributed to the products renders the end product very expensive and therefore less competitive, unless the target public is so well defined that the differentials of product quality and brand name recognition are appreciated. Only Company D stated that they partly work with a collection theme. The other companies do not use a theme for their collections.

5.2 Design Management

The term management means to manage, to administrate. Two companies were not able to define the term Design Management. One company related the term only to sales performance, and two companies related it to records, control and administration. Three companies presented quality as a differential for their products. Modeling and customized trims and materials for sewing were mentioned as differentials by two other companies. Therefore, the elements mentioned as differentials by companies in this study represent the minimum necessary to offer their consumers. Figure 2 shows a compilation of modeling carried out at Brazilian companies through the Design Management module proposed by authors [5], as well as the weaknesses found in its application.

Item 1 of Figure 2 represents preparation of the concept and is connected with the strategic area. Out of the studied companies, only Company D works with the preparation of the concept of the project and fully carries out the sourcing stage. Item 2 shows that none of the studied companies carries out the briefing stage. Item 3 demonstrates that all the companies carry out the stages of prototyping and revisions of the product prior to manufacturing it. Item 4 shows that only Company D works with experimental production equivalent to the showcase. This is so because it is the only company that has a focus on retail distribution. In this case, it is not a strategic stage but is an operational stage, as the product is not experimental but rather is sent to the sales representative. Regarding item 5, the stages are fully carried out by all the companies. They all carry out full production and the launching promotion of the collections every season. Item 6 reveals that the companies carry out partial evaluations of the products regarding their sales performance, but these cannot be considered strategic evaluations as proposed by the above mentioned authors [5].
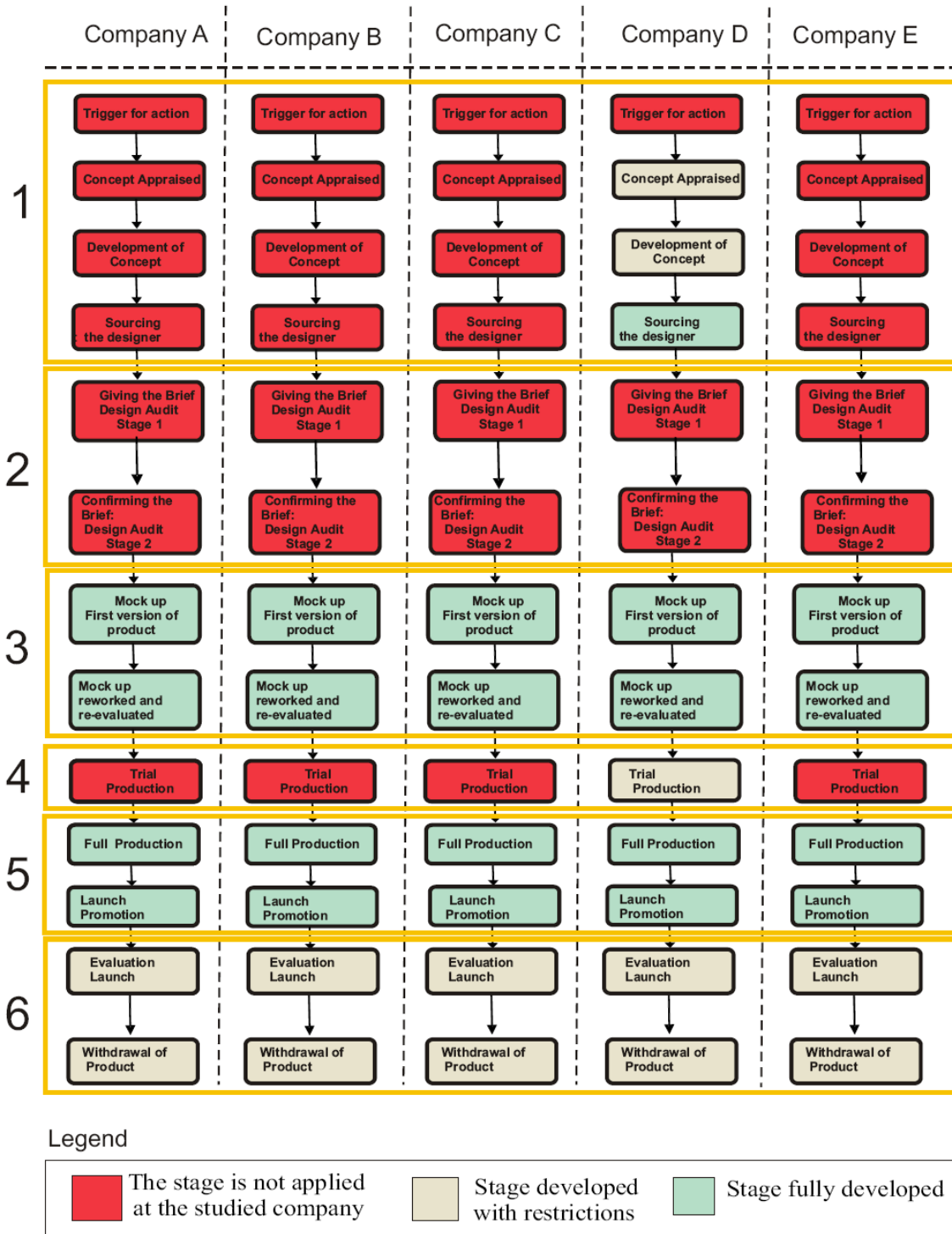
Figure 2. Modeling of the product development process of the studied companies, based on the model of Design Management proposed by [5]

Regarding this study, Company D presented a relevant difference in comparison with the other companies. They rethink the brand concept, even if informally, and create (verbal) strategies for the positioning of the brand. It is the company that has the highest number of stages proposed by the [5] model and more adequate professionals in those functions. They are concerned with having such elements as a well-defined mission, a vision, an organizational chart, and consult an organizational psychologist. In addition, they have an efficient creation sector, as well as a marketing sector. This result could possibly be associated to the fact that this company has a productive focus on retail and obtains a clearer and more objective communication with the consumers via the sales point. Author Borja de Mozota [18], corroborates this idea when stating that design adopts different entry routes to

be integrated in an organization, and one of the most common structures for the initial integration of design management is the retail space and the positioning of the brand in the retail trade. The result of the analyzed variables may be discussed following the table 4.

Table 4. Compilation of the results about Briefing, Sourcing and Evaluating elements

VARIABLES	COMPANY A	COMPANY B	COMPANY C	COMPANY D	COMPANY E
1. About Briefing Method					
1.1 What do you understand by briefing?	They do not know	They do not know	Visual panel, collection text	Collection text	Internal design
1.2 Do they have a briefing process?	No	No	No	No	No
2. About Sourcing Method					
2.1 What Sourcing method do you use?	Internal design	Internal design	Internal design	Internal design	Internal design
2.2 Do they have a creation department?	No	No	No	Yes	No
2.3 Who is the designer?	Family member	The business woman	The business women	Professional designers	The business woman
3. About Evaluating Method					
3.1 How is evaluation done?	Every fifteen days	Weekly	Every fifteen days	Through the orders	Weekly
3.2 What are the criteria used?	Sales performance	Sales performance	Sales performance	Evaluation of previous collections and sales performance	Sales performance

5.3 Briefing

Out of the five studied companies, none carries out the briefing stage. Also the companies that mentioned the concept of briefing did so with a sense different from that of [5], and did not carry out any of the mentioned types of briefing. The clothing companies studied do not have the habit to perform stages regarding briefing, because the collection projects that take place every six months are similar; hence no projects are developed from specific needs. This obviously does not justify not using briefing. This element may improve communication of information within the company and serves as a record of initial information. With the performance of briefing it is possible to effect the evaluation processes with more precision.

5.4 Sourcing

This is related to the search for the designer to carry out the project. In the research mentioned, all companies use internal design. At four out of the five companies, the function of designer is performed by the business person or by some family member. Only one company has a professional designer and a creation team. In spite of the fact that the business people who perform the function have a technical or higher degree in the fashion area, frequently the acquired knowledge base was not put into practice. This indicates that even with the acquired competencies they are incapable of overcoming existing vices. This was noted when interviewing at one of the studied companies whose business person had a technical degree in Fashion. This means that it is not sufficient have a degree in the area, it is necessary to become a transformation agent in the practices of the company, i.e., to try to apply the acquired knowledge. Out of the five companies, only one has a creation department with a designer and tasks oriented toward product development. As to the hiring of project freelancers, two companies have never had any experience with this type of contract, and three companies have already had the experience, but did not take advantage of it. The reasons are clear, such as for example, disconnected drawings regarding the profile of the brand name, lack of exclusivity of the drawings and lack of

involvement with the company. The sourcing methods most frequently mentioned were hireing a designer from a fashion school and by indication. One of the companies did not answer this question, arguing that they did not know the answer. Out of the five companies, two mentioned that a designer is still regarded as cost and that this type of investment did not pay for its self. It is worth pointing out that these last statements are neither based on statistical analyses nor on researches that prove that the investment in having a professional designer does not bring any financial compensation to the company.

5.5 Evaluating

The evaluation stage is an important moment for coordinating information between the beginning and the end of the project. The criteria for analysis may include: the evaluation of the concept regarding market success through sales performance; evaluation of the concept regarding briefing and corporate design, and performance in comparison with the competition. Therefore, one of the questions in the interview involved the degree of knowledge on the competitors. The life cycle of the fashion products is extremely short, so, the stores must be supplied on an almost daily basis, and a follow-up evaluation of products recently introduced into the market is required. Therefore, of the analyzed companies, two answered that the analysis is done weekly, and the criterion used is sales performance. One of the business people prepares, once every week, a sales report, and according to the performance of each product, the decision is made about whether to continue producing them or not. Company D reported that the evaluation is done based on the orders from the sales representatives. Since they act only in retail sales, they have a different profile in terms of evaluation. Through the sales schedule, the product has a defined market time and every eight weeks a new mini collection is introduced to be distributed in the three states where the representative is active. There is no daily product supply. However, evaluation should not be restricted to sales performance since it is necessary to make a general evaluation of the whole season. It is also necessary to report on what worked well, what had good sales, the failures and success, analysis of the competition and evaluation of the concept. This means that the companies carried out this stage only parcially.

6   CONCLUSION

The goal of this research was to make a qualitative analysis on a limited sampling of five Brazilian clothing companies located in the city of Araranguá, in the state of Santa Catarina . The purpose was to diagnose the degree of integration and management of design in the production process through an in-depth interview and qualitative evaluation of the data resulting from the. scenario studied. Presently the city of Araranguá has 70 registered companies in the area of clothing and approximately 200 informal companies.

The five companies studied, classified as small-size companies, could take more advantage of the fact that they are still small [19]. For example, by studying the market and the competition, creating strategies, and working with the concept of design in order to get established more effectively in their chosen segment. However, making this happen is not very simple, as these business people have given priority to the development of operational tasks instead of tasks aimed at the preparation of strategic planning. Many times they assume the functions of up to three different professionals. The most common ones are fashion designer, modelist, finances, marketing, communication and production (lining, cutting and sewing). These activities require dedication and concentration if they are to be performed adequately. Of course, if business people are directly involved in the practice of these functions they will not have time to dedicate to strategic issues. However, it is through strategic planning that the company can most effectively direct their actions, therefore, this planning is as important as the operational tasks. This centralization probably occurs for two reasons: the first one is to decrease costs, and the second one is insecurity in delegating tactical level tasks, i.e., tasks that are not only mechanical and operational but that also involve decision-making [19].

Another important factor that is reflected in this study is the lack of regulation of the profession of Fashion Designer. Since this profession is not well defined academically or its practice regulated anyone can perform this function, i.e., everyone can create clothes. Regarding employability, there is no difference in employability between technical level studies and university studies. Even without a degree, a person can be considered a fashion designer. This makes professionalization difficult and in addition to this, existing courses in the area often serve only as a complement to empirical knowledge. The business people/students, in the majority, continue with their old practices, even knowing that

they should improve some production and managerial processes. In view of this reality, there is no perceived "need" to hire a fashion designer. It is worth remembering that hiring a professional fashion designer will not only provide for technical information on fashion, but also for innovating proposals, different visions and possibilities for improvement. Since the function of professional designer is often questioned in the companies, the possibility of a project manager is not even to be considered. This goes far beyond the reality of these companies. It was possible to note that the business person acts as project manager but lacks an administrative background. The schools that offer fashion courses have their curricula focused on the creation of products and have deficiencies in management competencies [20], [16]. This factor aggravates the situation of the clothing companies.

In this study a considerable difference is seen between companies that distribute to wholesale and those who distribute to retail. The majority of the companies studied sell to wholesale and have more difficulties in customizing the brand name, in working with a specific theme and in selecting a target public. These characteristics are extremely important in fashion product design. Some specific issues regarding the processes of design in the studied companies were discovered which may serve as references for possible improvements and so the answers to the question considered in this research are presented as suggestions for improvement in each company, according to the result obtained in the data collection, and are:

- Hiring an apprentice for the area of creation and marketing [19].
- Definition of target public [23], [22].
- Acquiring effective knowledge of the needs and desires of the consumer [23], [24].
- Definitions of a business focus [22].
- Improvement in management practices through clarification (consulting).
- Use of a theme as the essence of the collection [22], [25], [16].
- Decentralization of operational functions [24].
- Definition of the vision, mission and global objectives; records of strategic planning [22], .
- Implementation of the following tools *briefing*, *sourcing, evaluating* [5], [10], [9].
- Meeting for direction and positioning of the brand name [23].

Regarding the comparison of the data obtained in this study with that of the study by [5], it is possible to conclude that, although there were differences between the studies with regard to fashion and design projects, the three key elements proposed by the authors in their model of design management were not fully implemented. One decade later, these elements are not yet applied by the Brazilian companies in the sample examined in this research. Some reasons are evident, such as the lack of understanding of the terms *briefing*, *sourcing* and *evaluating*, even by people with a technical education in the field. This demonstrates a failure, not only in the corporate environment, but in the education of designers. According to the concepts of [5], four companies perform design management at the operational level, only one performs design management at the tactical level, and none perform design management at the strategic level. It is believed that the companies studied can improve their performance considerably, reduce instability and become more competitive if they apply the key elements proposed by [5] from this point onwards.

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