INVESTIGATION OF INTERNAL AND EXTERNAL DESIGN TEAMS DURING THE PRODUCT DEVELOPMENT PROCESS IN FOOTWEAR COMPANIES

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ABSTRACT

This paper aims to analyze the management of internal and external design teams during the product development process in two footwear companies of Paranhana Valley in Rio Grande do Sul, Brazil. A case study was conducted in both companies that worked with both types of teams. The study provided a valuable discussion about how a company can work with internal or external design teams or both of them once the literature does not provide sufficient background to this matter. It also discusses the advantages and disadvantages of working with each team. Results indicated that differences in the way of managing the teams are related with the decision-making autonomy given to the members of each design team at the beginning of the development of new projects.

Keywords: new product development, design management, design process, design teams

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1   INTRODUCTION

According to Bruce and Bessant (2002), the successful insertion of a product in a given market is related to the improvement of the design management in a company. In the design management process, well coordinated project teams are more likely to develop successful products or services.

In Brazil, there is a lack of studies addressing the way that both internal and external design teams have worked in product development companies. Studies carried out in the design management area in Brazil (Martins, 2004; Andrade, 2009; Costa, 2010; Libânio, 2011) have mentioned the existence of different kinds of design teams, but they have not explained the relationship between team type and production processes. If design is seen as a project activity (Bonsiepe, 1982; Maldonado, 1993), then the work done by a design team is directly linked to the production process. Therefore, understanding how such relationship occurs and finding out whether the kind of design team has some influence on the production process would favor an adequate process management, so that differences resulting from the team type could be compensated with other resources. Companies can work with internal design teams (when a designer is hired by the company as an employee), external design teams (when the company outsources a designer, or a design consulting agency works for the company) or mixed design teams (when both types of teams coexist in a firm, and the designer hired by the company is supported by an outsourced, specialized agency).

This paper aims to study product development companies and how they can benefit from the management of internal and external design teams in order to evolve their goods more efficiently. The study has its focus on the collaboration between both teams, reinforcing their learning process and taking advanteges of their central competences. In order to do that, two case studies were carried out in two companies belonging to the leather and footwear industry in the south of Brazil. This industry has been chosen due to its economical importance to the country. According to data published by the 2009 Statistic Report of the Brazilian Footwear Industry Association, Brazil is currently the third largest manufacturer of footwear in the world (after China and India).

2   THEORETICAL BASIS

2.1   Footwear Industry in the south of Brazil

The Brazilian leather-footwear chain consists of industries that can be divided into four main segments (Rocha and Viana, 2006): (a) footwear industries (leather or synthetic materials); (b) leather artifacts (bags, briefcases, among others); (c) leather tanning industries; and (d) leather and footwear components.

In Rio Grande do Sul, where the leather and footwear industry has a strong impact on the local economy, design is also a means to add value to products, "since the expansion and strengthening of the footwear and leather manufactures industry as an outstanding activity has always depended on other factors" (Brasil, 2003).

Data from 2009 provided by the Brazilian Footwear Industry Association of Rio Grande do Sul, have confirmed that there are more than 2,700 footwear companies in this state, totalizing 35.1 percent of the national production. In 2009, the state exported more than 51 million pairs, which accounted for 31 percent of the total exported by the country.

2.2   Design Teams

An internal design team corresponds to a design sector or area as part of either a technical or commercial department, or a department reporting directly to the company top management (Bruce and Morris, 1994). Better integration of designers into the product development team and increased knowledge of business practices, greater involvement with the company, and greater ability to handle problems along all the development phases, are the strengths of establishing an internal design team (Bruce and Morris, 1994).

It is not uncommon for companies to hire a design consulting agency to help them with a design strategy proposal, since obtaining valuable stakeholders from other business units can be crucial to the success of a design strategy (Best, 2006). For Borja de Mozota (2003), in the first project developed by a company, it is common to hire an external designer to minimize the risks of using design for the first time. According to the author, design outsourcing also facilitates integration with a hierarchically

higher level, creates more flexibility, favors the supervision by a design team, and allows more control over the project costs.

Berends et. al. (2011) have explained that external designers suggest activities, propose phases to perform such activities and can be involved in planning and monitoring the design processes.

Best (2006) has stated that an external team can work both in short-term projects and longer-term projects. This could provide the companies with more financial flexibility. However, in small companies with resource restrictions, hiring external designers may cause them to focus only on short-term results (Bradford and Childe, 2002). Despite that, the fact that such companies do not have to establish an internal department and can hire agencies in consonance with their projects gives them more flexibility to allocate resources.

3   RESEARCH METHOD

In order to analyze differences between production processes due to the type of design team, a single-case study was carried out in a leather and footwear company in Rio Grande do Sul. The company has two design teams. One of them develops products for the company's brand (Company A) and works as an internal team (Team A). The other design team (Team B) develops products for another company (Company B). Therefore, it works as an external team for the company that controls it.

The study involved the comparison between the actions of both teams with the aim of understanding the influence that the type of team has on the process development. To guarantee the reliability of the data concerning both design teams participating in this research, some aspects should be controlled so that the study could keep its focus on the comparison between the teams working in the product development process. Thus, aiming at increasing data reliability, the companies selected produced the same end product and their main sales channel was also the same. In the case studied, both teams also produced for the same market segment (upper class and upper middle class), and their product development processes were similar.

A non-probabilistic sample, which was defined for the sake of convenience, was used. Although the results cannot be generalized, in this case, the rich discussions about the way that both teams act in the same company can benefit them by pointing out gaps as well as work opportunities.

Data were collected through in-depth interviews based on a semi-structured protocol. The design of the interview protocol considered the existence of three key factors, as it was proposed by Bruce et. al. (1999), namely, *sourcing, briefing and evaluating*. The study carried out by these authors was chosen because it is one of the few investigations that clearly explain how design is managed in the product development process. Besides, Bruce et al. (1999) conducted several case studies, thus facilitating comparisons to further works.

The interview with the manager of Company A, who participates in almost all of the stages of the process, guided most part of the study and served as a basis for the first sketch of the product development process of both companies. Besides, the in-depth interviews with the other employees confirmed whether the processes and stages pointed by the manager really occurred as he reported.

Besides conducting the interviews, the interviewer followed the processes, and some documents, such as the strategic planning, the definitions of the internal quality program and job descriptions were analyzed to check data presented and justified in the interview.

4   RESULTS

4.1   Company A

Founded in 1997, Company A comprehends a factory unit and a general office. At the office, which is the object of this study, 36 employees develop women's and men's shoes, bags and accessories. However, women's shoes, particularly those directed to the 25-40 year old age group, are the company's main product. Until the end of this research, the company had 22 exclusive shops and more than 600 multi-brand points of sale in Brazil. Besides that, the company exports for more than 30 countries. Regarding the exclusive points of sale of Company A's brand, only two of them are owned by the company, and the others are franchises.

The person in charge of following the whole process of data collection and the first one to be interviewed was the product director, or product coordinator. Her function is to coordinate both the development of private label products and the services provided by the company to third parties. The director reports to the company manager, who is also the company president and owner, herein called

manager. The manager also follows the whole process but with little emphasis on the operational stages, because he is more focused on business strategies. Today, with the brand growth, the manager accumulates activities that are more specific to his function. He said he is involved with all the areas, but more concerned with decisions related to the development of new products.

The schedule for product development is established by the product director, together with the manager. The director controls deadlines and the quality of the products developed. Cost issues are managed by the sales department, since costs do not restrict development, even if the production becomes costlier, because there are customers willing to pay higher prices. Anyway, the product director needs to have some knowledge of production costs to guide the product development, as some models of the collection are focused on lower cost and increased sales.

On average, 220 models are developed per collection. The evaluation of product success is based on the sales ranking report. There is a weekly ranking of franchises and multi-brand points of sale to control the sales of produced models.

There is neither documentation nor processes to evaluate product success. The team relies on sales success, which is considered for the development of future collections. The company explained that the buyer behavior is also evaluated, since the brand manager, who follows the daily activities in both the franchises and the company shops, also participates in the committees that define what is going to be produced: "The brand manager is usually attentive to the retailers' reactions when they see the products. Based on this kind of information, we build the collection", says the company's president and manager. It was possible to notice that the evaluation is subjective, since it is not performed either through specific tools or validated research processes.

4.2 Company B

Company B was founded in 1975. It started as a service provider and today it is one of the largest footwear companies in Brazil. The company has more than 5,500 collaborators and basically produces women's footwear. It has four brands, but only the processes related to one of the brands have been analyzed in this study.

Therefore, Company A and Company B have approximately the same number of people involved in the processes. This prevents the data analysis from being contaminated by distinct processes developed by the companies under consideration.

Today, Company B has nine factories and works both in Brazil and abroad. It is a limited liability company, and its capital is divided into shares; hence, there is neither a company owner nor an entrepreneur with personal interest in the company results.

The first interviewee in Company B was the product development manager, herein called manager. His function is to coordinate the technical modelers who draw the products. He is also responsible for adapting the work of the creation department to the production norms. The manager reports to the product director, who is also fundamental to the process. His function is to plan and develop the whole mix of all the brands.

According to the manager, several decisions are made along the process, but the president always has the last word. However, he said that the previous definitions (under his responsibility) both guide the work and help the president to make decisions.

On average, 36 lines of footwear are launched per collection. Every 15 days, six lines are removed and six new lines are introduced into the market. Some shoes of the collection are directed to specific customers, and not all of the models are sold in every state in the country, since the climate differences in Brazil require specific collections. The external team has autonomy to suggest the number of pairs of each kind (sandals, pumps, and peep-toes, among others) that will be launched, but the decision is made by the company product committee, which includes the president, the manager, the commercial department and the product director of Company A, and designers of the other brands of Company B.

Similarly to Company A, the evaluation of product success in Company B is based on the sales. Besides, they consider that the sales of a product line will only be successful if the products are comfortable and good-looking, i.e. they also associate the sales results with product quality. In this case, there are two ways of assessing the sales: sales to retailers, and sales to end consumers. Some lines may be successful among retailers, but may not succeed in terms of end consumer. Hence, both situations are taken into consideration, but with an emphasis on the end consumer.

A comparison between company A and B is presented on Table 1.

Table 1. Company Comparison

COMPANY A	COMPANY B
Founded in 1997	Founded in 1975
1 fabric + 1 office	9 fabrics
About 70 employees	About 6000 employees (including other company brands)
Internal design team	External design team

4.3 Product Development Process in the studied companies

In order to understand the insertion of both design and design management in the companies, as well as the differences attributed to each kind of team, it was important to find out the differences and points of convergence between the stages of product development in the companies under study.

To guarantee the quality of the data, it was necessary that the team members confirmed the stages of the product development process initially described by both the product director of Company A and the manager of Company B. The respondents were required to rebuild the process according to the stages previously described. In order to avoid any influence on the description presented by the other team members, and considering the time that each respondent had available to participate in the study, a photographic record of the assemblage stages was made. Pieces of paper with the denomination of each stage were randomly shown to the interviewees, who were asked to order the stages according to their understanding of the development process used in the company.

In an attempt to avoid a simple confirmation of what had been previously presented by the director, the respondents were given the following instructions: (a) each stage described could be used as many times the respondent regarded as necessary; (b) some blank pieces of paper were provided to enable the respondents to add stages that had not been included; (c) the respondents did not have to use all the pieces of paper provided; and (d) there was neither a minimal nor a maximum number of stages required.

The stages pointed out by the product director and by the other employees were similar. Some of the respondents presented a more detailed process, while others simplified some stages. The combination of those sources allowed the design of the general product development process.

The employees who described processes related to the external team explained that, from the stage of 'mockup development' on, the process is directed to Company B. These employees suggested the stages according to information they had about the process, saying that they were not involved in it, but usually controlled the development until the final phase. In Company B, these stages were confirmed by the people involved in the process.

It was possible to notice that there was agreement as to the stage order. The technical personnel showed some limitations by suggesting the stages proposed by the director, but the team was sure of their choices.

With the stages pointed out by the employees and data obtained from the in-depth interviews, it was possible to design the general product development process and identify common stages as well as stages that were not included among the tasks performed by each type of team. Figure 1 illustrates the product development scheme of both Company A and the brand analyzed of Company B.

The difference between the processes is basically related to the way that the companies work with sales representatives. Team A works directly with representatives that sell the footwear models before the final production. In this way, the internal team works with two more stages in comparison to the team of Company B, which executes them at the end of the process. These two stages are the only difference between the tasks performed by the two types of teams analyzed in this study, even considering that the work is developed in different companies from the sixth stage on.

STAGE	
1	Research trip
2	Evaluation of tendencies
3	Mix definition
4	Definition of shapes, colors and metals
5	Model design
6	Mockup specification sheet
7	Mockup development
8	Mockup approval
9	Model fitting
10	Mockup adjustment
11	Sample specification sheet
12	Dispatch to factory
13	Purchase of materials
14	Sample production
15	Final production

Legend:

☐ Stages common to both teams

☐ Stages executed only by the internal team

Figure 1. Product Development Process

5   ANALYSIS AND DISCUSSION OF THE RESULTS

The participation of both teams in the process is quite similar. This is due to the fact that they have the same number of members, the same product coordinator and similar stages. The difference is at the end of the process. As the stages of product approval and finishing are executed in Company B, Team B (in charge of the product development process in Company B) ends up being less involved and working based on information defined by Company B itself. This team does not participate in the decision-making. The decision committees are formed in Company B, with the participation of the product director of Company A, some members of Company B and the president. The product director of Company A, who also participates in the committees of Company B, explained that "Company B, as a customer and a factory, both leads growth and defines the amounts of lines and models".

Both teams are composed of six people and the product director. The teams comprise the following professionals: materials manager, construction manager, technical manager, stylist, specialist in norms and specifications, and bag designer.

Figure 2 shows the stages in which the whole team participates, the stages in which only one team member takes part, and the stages in which none of the design teams is involved. This was determined from what was identified by the respondents; at stages showing differences, the director's opinion as well as what the team members had said in the interviews were considered.

In general, the product development processes analyzed in this study are similar for the brands studied in Company A and B. The differences between the processes result from the fact that the companies work differently with sales representatives. The two different stages are directly related to the material developed and sent to representatives in Company A; this does not occur in Company B. Even the stages occurring in Company B have the same characteristics as those observed in Company A. The difference is seen in the people involved in the processes and decision-making.
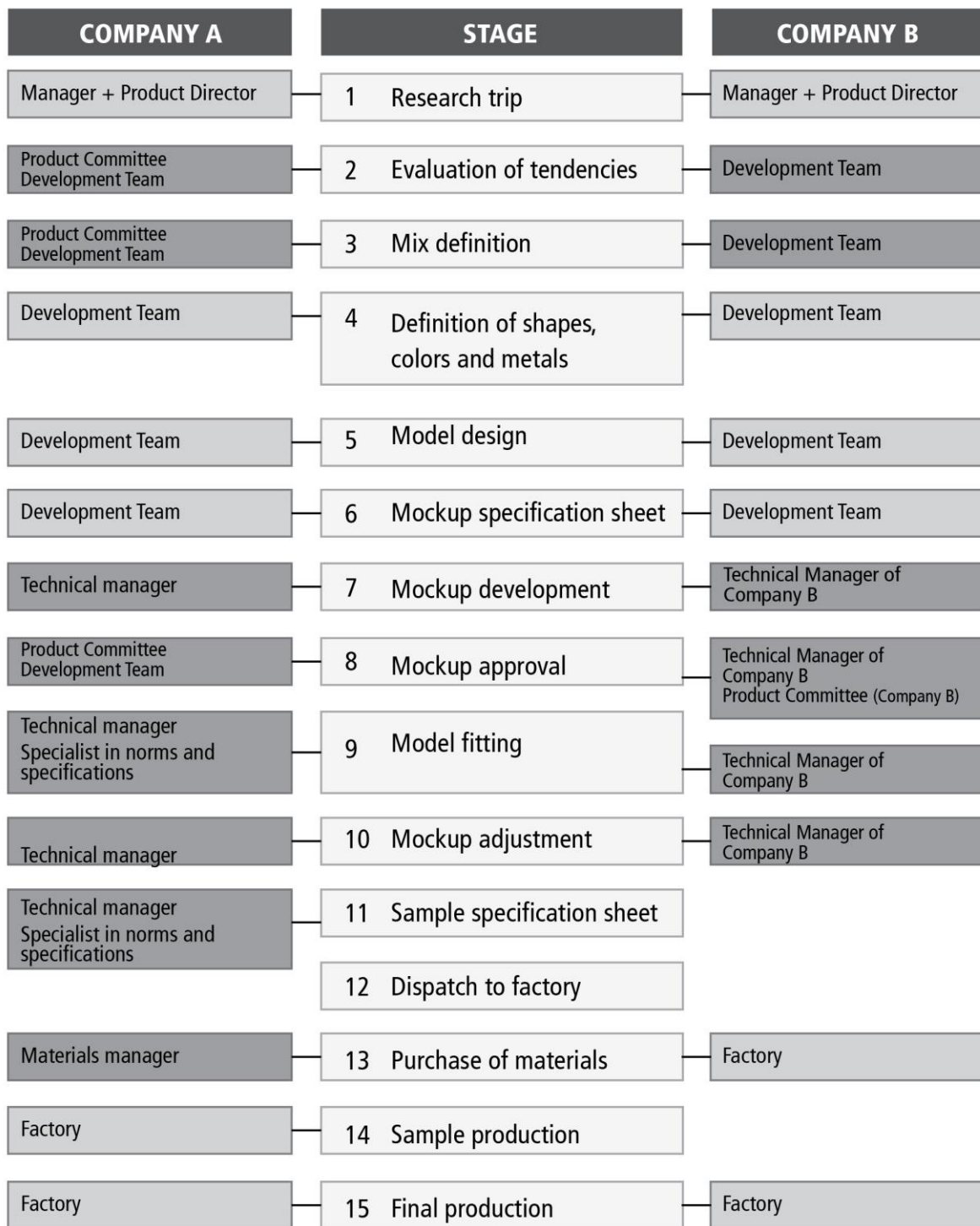
The meetings carried out along the whole process and people who took part in them were also analyzed in both companies. In Company A, whenever there is an important decision to be made, a meeting of the product committee is held, involving the marketing, development, commercial and sales departments, shop management, as well as project and design managers. Such meetings allow the participation of all the departments in the process to guide decisions and bring contributions from each area. The meetings with the product committee evidence a general focus of the company on a common goal, which is turnover.

Company B also holds meetings of the product committee, which is formed by the commercial department, the president, Company B manager, and Company A product director. They said that designers of other brands of Company B also participate in those meetings, even in the ones related to products developed by the external team. This contradicts the justification given by the company to use an external design team. According to Company B, they outsource design work because the production of the brand analyzed in this study involves the designer's focus on what is being produced, thus, if designers of the other brands of the company become too involved in decisions related to the outsourced work, they will not concentrate only on their own footwear line. Besides, they stated that all the opinions are respected, but the company president always has the last word.

6   CONCLUSIONS

Although the teams have not shown relevant differences in their results concerning the products, this study has shown that the internal team is more easily controlled and integrated into the process as a whole, and also evidence more knowledge and expertise in design. The product director of Company A explained that "design is the essence (…). The company was born with that, the company is that… So, everybody, even the managerial area, which is more bureaucratic, ends up learning about design".

In small companies, there seems to be a tendency towards internal design, in an attempt to integrate design into product development more effectively. However, the internal team generates a higher production cost, which is passed on to the end consumer. This requires an effective coordination of the activities in order to justify the high cost of the project. Yet, an external design team may be a solution for a big company that wants to reach a new segment by bypassing concepts previously established for its brand. In this case, working with an external team enables companies to add value to their products without exceeding the cost of the end product that they can pass on to consumers.

COMPANY A	STAGE		COMPANY B
Manager + Product Director	1	Research trip	Manager + Product Director
Product Committee Development Team	2	Evaluation of tendencies	Development Team
Product Committee Development Team	3	Mix definition	Development Team
Development Team	4	Definition of shapes, colors and metals	Development Team
Development Team	5	Model design	Development Team
Development Team	6	Mockup specification sheet	Development Team
Technical manager	7	Mockup development	Technical Manager of Company B
Product Committee Development Team	8	Mockup approval	Technical Manager of Company B Product Committee (Company B)
Technical manager Specialist in norms and specifications	9	Model fitting	Technical Manager of Company B
Technical manager	10	Mockup adjustment	Technical Manager of Company B
Technical manager Specialist in norms and specifications	11	Sample specification sheet	
	12	Dispatch to factory	
Materials manager	13	Purchase of materials	Factory
Factory	14	Sample production	
Factory	15	Final production	Factory

Legend:

☐ Common to both teams

☐ Different for internal and external teams

Figure 2. Teams' Participation

A study carried out by Berends et. al. (2011) with the aim of understanding how an external design team can affect the evolution of the product development process in small companies has shown that an outsourced team not only develops complementary expertise, but also enhances design processes

and design management in those companies. The study has also stated that presidents of small companies have become involved in product development activities, despite lacking formal education in design. In Company B, which has an external design team, it is easy to perceive the lack of specific design knowledge, and this reveals that design capabilities derive from the external team. In this case, the external team's design skills may improve design capabilities of the company. Therefore, the consolidation of design in management processes of companies operating in the footwear industry does not depend on the type of team. Even without specific design knowledge, a company can aggregate an external team that is able to integrate design into the process.

In general, the teams are managed in a similar way. This is due to the fact that they share the same director, i.e. the coordination of all the activities, although at different moments, is performed by the same person. It is worth highlighting that controlling and developing an internal team is easier. The product director of the company admits that, although they have opted for an external design team, an internal team is more agile: "When a team is part of the company structure, it doesn't have to wait for the completion of the whole creation phase to present a project. Parts of a project can be shown as soon as the team gets them finished".

However, the high cost of keeping an internal design team may be decisive. Borja de Mozota (2009) has stated that the introduction of design is initially more accessible when it is outsourced. Corroborating this idea, Company A explains that functioning as an external team for Company B provides the latter with the whole structure needed and specific design knowledge at a much lower cost than an internal department with the same capability would do.

Finally, althougth this study shows relevant results for the segment, other studies in different areas should be accomplished to generalize results. Still, this study uncovers that companies without product development expertise can find differentiation through another company skills, reducing risks when it comes to the launching of new products. Further, using external design expertise can also be a way of improving their internal skills and learning best ways to carry on the entire project.

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