Competencies and Interactions in Design Management

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ABSTRACT

The inclusion of design in corporate strategies has been a recurring research theme, and organizations are using it as strategic element for gaining competitive advantage in the long term. Thus, it becomes evident the need to manage design activities, making use of concepts related to competencies, learning, dynamic capabilities and other aspects. Therefore, this paper aims at investigating what experts think about design management and competencies, joints and intervenient factors in Brazilian fashion industry. In addition, this article aimed at knowing how design teams are structured and the relationship of these with the organization. The methodology was exploratory, qualitative, through in-depth interviews with ten designers working in Brazilian firms in the fashion industry and four specialists in fashion design. We identify phases and activities of design professional, which are decisive for the design management occurrence in enterprises in apparel industry, identifying the coworkers at each stage of this process.

Keywords: Design management. Competencies. Interactions. Teamwork. Design strategy.

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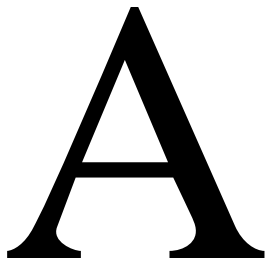**Address**: Paulo Gama Avenue, 110, Farroupilha, Porto Alegre - Rio Grande do Sul - Brazil. Cep: 90040-060.
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1 INTRODUCTION

A s part of the textile production and manufacturing chain, the garment industry has specific characteristics such as: its proximity to the end consumer and a great number of agents are involved in its production system by outsourcing. The latter factor, at the same time as it requires strong managerial control of the production process, enables speedy product development.

In the world context, Brazil is among the four main countries producing textile articles (PRADO, 2010), and the South Region of the country is the second main Brazilian producer of ready-to-wear clothing, next only to the Southeast Region (ABRAVEST, 2015). According to the Ministry of Labor and Employment, more than the 98 000 formal industries in the country employ over 600 000 workers (PRADO, 2010). In this context, the garment sector of the state of Rio Grande do Sul represents over 7,500 of these industries and employs around 21 000 workers (PRADO, 2010). Factors such as age group, gender, social groups and level of income are analyzed to determine the segmentation of these markets (ABRAVEST, 2015).

International studies have shown the importance of integrating the design team with the other participants in a project (REID et al., 2000; LAUCHE, 2005). In addition, concepts of shared knowledge appear (KLEINSMANN; VALKENBURG, 2008), as well as competences of organizations and professionals (BRUCE et al., 1999; BELKADI et al., 2007), leadership in design teams (LEE; CASSIDY, 2007) and design as an agent of knowledge and integration in the organizations (BERTOLA; TEIXEIRA, 2003; GIRARD; ROBIN, 2006) which also appear as factors related to design process. According to Libânio and Amaral (2013), certain aspects were initially discussed abroad, and debated in Brazil at a later point. Also according to the authors, characteristics such as leadership, autonomy, competences, entrepreneurialism, proactivity, communication, integration and capacity to work as a team were listed as essential requirements for design professionals.

Hence, the purpose of this study is to investigate how specialists see competences in design management, and also the articulations and factors that intervene in the context of the garment industry in the South Region of Brazil. Another objective is to become acquainted with how the design teams are structured, and their relationship with the organization, identifying who are the agents who participate in these teams.

2 LITERATURE REVIEW

2.1 COMPETENCES

The individual, collective and organizational competences are linked to the internal arrangements and the structuring and integration of teams in organizations. Retour and Krohmer (2006) define competence as an operational know-how. Ruas (2005) states that individual competence is based on a set of capacities directly related to the knowledge, skills and attitudes of the individual involved in the process.

The collective competences, on the other hand, according to Retour (2012), due to their tacit character and complexity are specific to firms and therefore difficult to imitate. Retour and Krohmer (2006) list as attributes of collective competences the common frame of references, shared language, collective memory and subjective engagement, according to table 01. However, Michaux (2009) emphasizes that it is more appropriate to take collective competences into account, first analyzing the nature of the group and the work situation.

Collective Competences	
Common Frame of Reference	Structures the collective action that ultimately is the result of comparing the experiences and representations of the people involved.
Shared Language	Common vocabulary used at work which even allows cognitive communication at the time of action.
Collective Memory	Learning (past collective learning and guidance of later learning).
Subjective Engagement	Subjective mobilization of the company-oriented people as a whole. Solving unforeseen events and a few dysfunctions that might interrupt action.

Table 1 - Collective competences
Source: Adapted from Retour and Krohmer (2006).

As regards organizational competences, Ruas (2009) states that "collective competences of the organization ensure that the mission, the vision and/or strategy of the company are fulfilled". Retour (2012) underscores that the key-competences, also called essential competences, help achieve the sustainable competitive advantage. According to the classification of Ruas (2005), table 02 subdivides the organizational competences into basic, selective and essential.

Organizational Competences	
Basic organizational competences	Contribute decisively to the survival of the organization over the medium term.
Selective organizational competences	Distinguish the organization with the space of competition in which it operates, contributing to a position of leadership or quasi leadership in this market.
Essential organizational competences (*Core competences*)	Distinguish the organization within the space of international competition, contributing to a pioneering position in this market.

Table 2 - Organizational competences
Source: Adapted from Ruas (2005).

2.2 STRATEGY AND DESIGN

Borja de Mozota (2003) relates strategy to design, saying that "strategy creates an adequation between company activities. The success of strategy and strategic design depend on doing many things well and integrating them. The whole is more important than any individual part. The right strategy is essential, not only for the competitive advantage but also for the sustainability of this advantage." (BORJA DE MOZOTA, 2003). The author adds that it is essential to define an entrepreneurial strategy that will incorporate design goals, the delimitation of a design strategy and the assurance that the design strategy will regroup products, communication, environment and information. Brown (2006) emphasizes the importance of communication and clarification of corporate strategy for the achievement of corporate goals.

Regardless the company's structure, Best (2006) states that the design manager needs to promote the best design strategy as possible when conceiving an organization as a whole. The author also argues that for this to happen stakeholders should first be convinced of the significance of a particular design strategy for the company. Several are the abilities required for a design manager position. Among them we will find leadership, entrepreneurship, vast technical knowledge, managerial skills, and a proactive profile, to mention a few. A design manager should be able to coordinate, motivate and persuade a team. Acording to Libânio and Amaral (2013), leadership, autonomy, competences (knowledge, skills, and attitudes), entrepreneurship, pro-activity, communication, integration and teamwork are important characteristics of design professionals.

3 METHOD

The method used in this study was exploratory, following a qualitative approach and conducted through a survey of literature and also through in depth interviews (MALHOTRA, 2009). Malhotra (2009) emphasizes that the main focus of exploratory research is to help the researcher to understand the problem-situation. The author also says, regarding qualitative research, that this is a non-structured, exploratory research methodology based on small samples, enabling a better perception and understanding of the problem involved. Yin (2001) underscores that the case study is used as a research strategy when questions of the "how" and "why" type are asked, when the researcher does not control events and when the focus of research is on contemporary phenomena. Gil (2002) also highlights that the use of the study of multiple cases "provides evidence inserted in different contexts". The sample is non probabilistic, chosen by convenience. According to Malhotra (2009) the sample is small and

non-representative for this type of research, generating maximal discernment and able to use, for instance, personal interviews with specialists in á given sector.

Two semi-structured scripts were elaborated for use in the in depth interviews. Ten designers were interviewed who work in companies belonging to the garment industry, and four specialists in fashion design. The specialists in fashion design were chosen for being a reference in its field, and the fashion industry companies are leading companies in the Brazilian garment industry. According to Malhotra (2009), specialists are people well-informed about the subject and sector in which they work. The data were obtained from primary sources and the research procedure used was a direct and personal approach in the interviews. The interviews were taped, transcribed and the data tabulated for later analysis. The professionals interviewed were divided into two groups: market professionals and specialists. The content of the data collected was analyzed (BARDIN, 2013), aiming to achieve the objectives of this research.

The classification of Ruas (2005) and Borja de Mozota (2003) was used to analyze the competences, the classification of Retour and Krohmer (2005) for individual competences, and the classification of Ruas (2005) for the organizational competences. Relevant points were also identified for analysis concerning aspects related to competences, such as education, knowledge, dynamic capacities, organizational routines, analysis of market context and organizational culture, interactions and stakeholders involved in the process.

In order to ensure the anonymity of the interviewees, they are identified as Specialist 1 (S1), Specialist 2 (S2) and Specialist 3 (S3), and so successively, as well as Designer 1 (D1), Designer 2 (D2), Designer 3 (D3) and so on successively. The characterization and profile of the interviewees were organized and placed in table 03 and table 04.

Table 3 - Characterization and Profile of Specialists Interviewed

	Title	Experience in fashion market
Specialist 1 (S1)	PhD	15 years
Specialist 2 (S2)	PhD	15 years
Specialist 3 (S3)	MSc, currently doing a doctorate	23 years
Specialist 4 (S4)	MSc, currently doing a doctorate	14 years

	Interviewee's position in the Company	Size of Company
Company A	Designer	Small
Company B	Manager for Technical Development of Products	Large
Company C	Manager for Product Development	Medium
Company D	Stylist	Medium
Company E	Stylist	Small
Company F	Designer	Small
Company G	Designer	Medium
Company H	Stylist	Large
Company I	Stylist	Small
Company J	Designer	Small

Table 4 - Characterization and profile of designers in garment industry companies

4 RESULTS AND DISCUSSION

The aspects analyzed were classified into discussion groups: characteristics of companies; phases and activities of product development and agents involved in design management; competences; articulation of resources; communication, interactions and learning. The competence analysis group was subdivided into individual, collective and organizational competences.

4.1 CHARACTERISTICS OF COMPANIES

Company A is a small 36-year old family business operating in the south of Brazil. Its production is outsourced and its end product is directed at young women. Company B, on the other hand, although large, outsources its production entirely. It has been in the market for 49 years and began its activities as a family business. Later it was sold to a group of investors. It serves men, women and children, with over 200 stores in Brazil. Company C is a medium-sized family business and has operated for 19 year in the export of sports products for the female public.

The production of company D is entirely outsourced to China. This company is medium-sized and has been in the market for 38 years. Its target public is male and female sportspeople. Company E has been in Brazilian market for 28 years. Although small, it has its own production, outsourcing only 30% of it. Comprising a network of more than 20 own stores, company E is present in other states of Brazil through the franchising system. It defines its target public as young female executives. Company F is small, it is present in two states of Brazil, with a total of 9 own stores. It has been in the market for eight years and its target public is adult males.

Company G is a medium-sized family business that has been in the market for 58 years, and it is one of the largest retail networks in one state of Brazil with over 100 stores. Company H is a large family business, 50 years in the market for female clothing. Company I is small, six years in the market of the state of Rio Grande do Sul, Brazil. Its production is

completely outsourced and its end product is directed as the adult-female-sports public. Company J is a small family business; 29 years in the market of the state of Rio Grande do Sul, Brazil.

4.2 PHASES AND ACTIVITIES OF PRODUCT DEVELOPMENT AND AGENTS INVOLVED IN DESIGN MANAGEMENT

The specialists interviewed were unanimous in underscoring that design management already begins when the organization strategies are elaborated, and emphasized the importance of design professionals participating in this stage and also being part of the board of directors. This is because, in order for design management to occur in the companies, design must be part of the culture and the organizational strategies, and be perceived as a value (BORJA DE MOZOTA, 2003; LIBÂNIO; AMARAL, 2013), and design as an agent of knowledge and integration in the organizations (BERTOLA; TEIXEIRA, 2003; GIRARD; ROBIN, 2006).

Regarding what was mentioned by the design professionals in the companies researched, some of them (companies A, C, D) began to report their product development process beginning with the development of the products proper, and said emphatically that they do not perceive design as being part of the organizational strategies. Furthermore, these companies stated that there is no participation of design professionals during the process of defining organization strategies, and that they are called to opine on guidelines pre-established by the directors for the new collection. On the other hand, the interviewees of companies E, H and J highlighted that the design professionals work in the construction of the guideline of the new collections, together with the directors, but that the latter are responsible for the final opinion. Companies F, G and I emphasized that there is a design professional who is part of the board of directors and that design is considered a value in organizational strategies. They also added that the design professionals elaborate the guidelines for the new collections and are directly or indirectly present at all stages of the product development process.

Based on the definition of the guidelines for the new collection and its products, there is a stage during which the trends are surveyed all the way to monitoring the market, including creating the collection, production of the pilot pieces, production of the collection, review and control of quality and distribution of the products and then following customer satisfaction. It should be highlighted that if all interviews are grouped together, the participation of a person responsible for design is noted, whether the designer or the stylist, or the director of the style department in the stages of the product development process reported by the interviewees. It

is also underscored that each stage requires data, information and competences that need the involvement of different individuals, teams, sectors and suppliers of raw materials and/or services, composing multidisciplinary teams. The presence of a representative of creation at each stage, be it the stylist or a style director, is necessary to follow and monitor the piece throughout the product development process, as observed in table 05, acting directly or indirectly.

The representative of creation will also follow the manufacturing of the pilot piece, the production of the collection (modeling, production, following the suppliers) and the final review and quality control of the pieces produced. Specialist A pointed out that this representative will also be responsible for conveying the concept of the collection to the commercial representatives, salespeople, store managers and other individuals who work at the point of sales. This representative of the creation sector should always interact with the other stakeholders responsible for each of the productive stages. Already in the final stage of market monitoring, the representative of the creation sector should return to the point of sales, and also monitor, in social networks or other research and feedback media, how the piece produced is being accepted by the consumers.

The characteristic of the complex management of this chain of suppliers of the garment industry, and also the exchange of information and knowledge with these agents is the great number of individuals involved, and consequently, requires great flexibility and adaptability to respond to the constant demands of the market. This outsourcing of production is a reflex of a market dynamics and the result of a strategy that favors greater flexibility and agility in the production processes, consolidating production networks in a same organization.

There is a controversial point involving outsourcing of production: larger companies giving contracts to small suppliers. With automated processes and using high technology, the great companies establish work relationships with small suppliers who sometimes work informally, with archaic production structures and processes, and low managerial qualification. Besides the differences in terms of structure, technology, quality and scale of production, these companies ultimately have to administrate a large number of people involved in the development process of a piece, making it difficult to manage production. It is not the heterogeneity that is being questioned, which might provide a rich exchange of information and knowledge, but rather effective forms of evaluation and control of the data flow, of the moments of occurrence, and of the people involved in each of them.

Phases and Activities /Agents involved	CEO	Product Design Director	Style Director	Marketing Director	Planning Director	Purchasing Director	Production Director	POS Manager	Production Manager	Quality Manager	Stylist/Designer	Purchasing Team	Marketing Team	Modelist	Pilot Maker	Seamstress	Suppliers	Sup. Of Manufacturing	Storekeepers	Salespeople	Shopwindow Decorator	Commercial Representative
Definition of organizational strategies																						
Defining organizational strategies based on company design culture	■	■	■	■	■																	
Elaboration of Guidelines and Research on Trends																						
Retrieving information on monitoring the market of the previous collection		■	■	■		■		■			■	■										
Defining design guidelines and strategies	■		■	■																		
Planning the offer	■			■	■						■											
Defining the concept of the new collection		■	■																			
Identifying trends			■	■							■		■									
Retrieving information from the database of previous collections											■											
Generating alternatives											■											
Defining concepts			■								■		■									
Defining raw materials					■						■						■					
Creating the Collection																						
Developing the collection			■								■	■										
Performing the technical design											■											
Elaborating a technical file with specifications											■											
Producing the pilot piece																						
Elaborating the file on consumption											■											
Implementing the modeling											■			■								
Implementing the Piloting work											■				■							
Gathering together everybody involved in the project to validate the collection	■	■	■	■	■	■	■	■	■	■	■											
Production of the Collection, Review, Quality Control and Distribution																						
Supervising production									■													
Storing information in a database													■									
Holding/participating in talks to the representatives and/or salespeople at the POS			■																■	■	■	■
Holding launch events			■																■	■	■	■
Monitoring the Market																						
Following the sales indicators and consumer satisfaction	■	■	■	■				■					■									■
Go to the POSs to watch the consumers' contact with the products.		■	■	■							■									■		

Table 5 - Phases and activities of the product development process and main agents involved in this process in the garment industry

Product development processes, such as modeling, part of the production and distribution can be automated. However, at the same time as the advance in technology

proved to be an ally to increase production, determinant stages of the clothes manufacturing process are still carried out manually, as in the case of the embroiderers or seamstresses making pilot pieces. According to Prado (2010), despite the technological advances this sector remains labor intensive. The interviewees from companies C, G and J take a seamstress from the production line to elaborate the pilot pieces. These seamstresses have tacit knowledge that is difficult to transform into explicit knowledge because there is no record of their information or knowledge. Nonaka (1991) underscores that tacit knowledge concerns technical skills, such as informal dexterity which is difficult to specify, ie., know-how. As an example, the author says that artisans develop specific "finger-tip" dexterity, and are unable to explicitly describe the technical principles involved in their capacity. On the other hand, companies C and H reported that in their factories knowledge and consequently learning is conveyed among the production line seamstresses, transforming existing tacit knowledge into new tacit knowledge. This, corroborating the statement by Capaldo (2007), shows the importance of encouraging organizational knowledge-sharing routines.

After the production cycle has ended and the clothing has been distributed, there will be feedback by the customer, which will be a useful tool for the people who create the clothes (BORJA DE MOZOTA, 2003). These creators, often a project manager, style director or even design manager, must follow three collections simultaneous. The fall/winter, spring/summer and high summer collections require that that professional follow three collections in parallel, by monitoring the acceptance of the products of the current collection in the market, the production of the pilot pieces for next season's collection and surveying trends for the collection that comes after this.

Considering the highlighted points, it is necessary to identify and structure moments and activities related to the development of items of clothing, which will determine the occurrence of design management. Aiming to distinguish their products to achieve sustainable competitive advantage, the garment industry companies need to give priority to stages of this process, such as: the initial stage, the definition of strategies and elaboration of guidelines and the concept for the new collection; the stage of research and retaining information and key/strategic knowledge; the stage in which teams with different types of expertise are grouped to discuss and validate the collection; the stage in which the concept of the new collection is conveyed to the managers, salespeople and storeowners at the points of sale, and also to the commercial representatives; and monitoring the market, both through data analysis and by direct contact with the consumers at the point of sale or in the virtual contacts. For this

it is necessary to help the companies monitor and evaluate the knowledge and information that circulate during this product development process, identifying articulations and intervening factors involved in this process.

4.3 COMPETENCES

4.3.1 Individual competences

The individual competences reported by specialists for the design professional are related to the scope of the project, by means of technical knowledge (design and production), specific knowledge (ergonomics, anthropometrics, design, fashion, culture), multidisciplinary, market and company business knowledge. The skills focus mainly on project and prototyping, on following the market (identification of trends, perception of culture and a sensitive look), on alterity, on communication and on planning the collection. On the other hand, attitude involves becoming part of the design and fashion systems (performing cultural surveys, seeking information, cultivating the habits of curiosity and alterity), engagement with peers, with the organization, its philosophy and business. These competences are in accordance with those listed by the people interviewed at the companies. The interviewees added knowledge of previous collection, creating models, pilot work and sewing, as well as quality standards. As to skills, they are mainly aimed at creation, project and production of the pieces and at the relationship with the other stakeholders. Strategic thinking skills do not appear.

As regards individual competences of the design manager, listed by professionals from the companies interviewed, knowledge was reported of the market (consumer, trends and demands), of the entire product development process and project, of the company (of the business and inherited from the family), of management, of the other participating areas (marketing, production, quality, legal and import) and technical knowledge. The skills focus on strategic thinking, relationship with the other stakeholders and team, leadership, negotiation, picking up on trends and what the market is demanding, and meeting the schedule. The attitudes deal with commitment, orientation towards results, building relationships, integrating and solving problems, according to Ruas (2005).

For the design manager, the specialists highlight knowledge (of the design system and fashion, of the external environment, of the collection as a whole, and inherited from the family), skills (to interpret the culture and the market movements and to think broadly), and attitudes (encouraging dialogue, sensitivity to the relational system, leadership, proactivity and orientation to results), turned mainly to a broad understanding of the entire process at the strategic and management levels.

4.3.2 Collective competences

The collective competences listed by the specialists and professionals were categorized according to the classification of Retour and Krohmer (2006), which subdivides them into a common frame of reference, shared language, collective memory and subjective engagement.

It is noted that the competences related to the common frame of reference concern, according to Retour (2006), the action of the collective based on comparing the experiences and representations of the people involved, agreeing with the perceptions of Jevnaker (1993) and Mishra and Shan (2009), who in their studies emphasized the importance of structuring, communication and integration of individuals and work teams. On the other hand, shared language is used by the companies (A, B, C, D, E, G, H e I), in verbal communication within the work environment, in contact with the national and international suppliers, or even in records in the technical information forms of the products. The specialists also emphasized the importance of business language for the designers, and of design language for the managers (S1 and S3) as well as the difficulty of communication between the purchasing and styling sectors (S2). Specialist S2 underscored the difficulty of communication because of the different cultures and languages, of importing and exporting products and raw materials.

As to the collective memory, the specialists take a clear position about assigning value to learning and congregating the collaborators and recording information in the virtual systems or servers. The company professionals also emphasize these collective competences, both in learning among individuals (companies A, B, C, D, E, F, G, H and I) or in storing information and data of previous collections in virtual systems or physically (companies B, C, E, F, G, J) and histories of production process (company H). This learning among individuals can take place by constructing networks (BERTOLA; TEIXEIRA, 2003; CAPALDO, 2007; BROWN, 2006) or even combining internal and external resources (BERTOLA; TEIXEIRA, 2003; BRUCE et al., 1999).

As regards subjective engagement, specialists emphasized the following: of the professional with high management, of the designer with the modelist, pilot maker and marketing department, of the creation sector with the sales teams, between the design professional and the other teams involved in the product development process of design management, and among the teams to meet deadlines and schedules based on shared work by establishing work routines. On the other hand, the design professionals interviewed showed this engagement in weekly meetings to analyze sales (company A), checking quality (company B, H), obeying other project specifications and also the deadlines and costs in the

production stage (companies C, D,E, F and J) and in the movement of the stylist throughout the product development process (company E, I).

4.3.3 Organizational competences

As regards organizational competences reported by the specialists and professionals, the classification of Ruas (2005) was used, which characterize them as basic, selective and core competences.

According to the specialists, and with the design professionals, it is observed that the basic competences are related to trend and consumption monitoring practices (companies E, F, G, H, J) as well as to the creation of a collection with a theme (company I) and the perception of timing to launch the collection on the market (companies C, H).

The selective competences on a level of daily practices, stage optimization, view of the creation sector as strategic, layout of the work environment and forming multidisciplinary teams with communication and integration among the sectors were listed by the specialists. These selective competences, according to the professionals interviewed, belonging to the companies, concern activities and relations regarding: customer loyalty to the brand (companies A and J), anticipation of trends (company B), pioneering (company C), interactions between the Project participants (companies D and I), layout of the work environment (company F), systematization of routines (company G), investment in training the employees and their vision as business owners (company B).

The core competences were identified only at companies B and F through fashion training sessions which all employees are encouraged to take (company B) and design guiding the organizational strategies with the understanding of high management of design as a value (company F). These competences listed reflect the course of design empowerment in the company (Specialist S1) and the insertion of design in the highest levels of the company (Specialist S3) agrees with the view of design guiding the renewal of strategy (RAVASI; LOJACONO, 2005).

4.4 ARTICULATION OF RESOURCES

Relating the resources to the field of design, Ravasi and Lojacono (2005) showed the view of design as a central resource. Gander et al. (2007) highlight the importance of identifying resources that can be shared and those that are valuable but which, if combined or transferred may decline or weaken, for instance, creativity development routines. In this way, these statements agree with the ideas of specialists S3 and S4 who underscored the fact that

routines related to creativity supply the moments of creation, such as: field trips, trend surveys, trips to identify new tendencies and analysis of consumer behavior in the market. Jevnaker (1993) underscores the work of design professionals as a valuable resource for the companies.

As to the view of knowledge as a resource, specialists emphasize that creation, conveying and retaining knowledge occur at given times, as in the survey of trends and creation of the collection, in following the production of the pilot piece, and in the presentation of the collection, both for validation to go into production and for the commercial representatives and people involved in the point of sales. However, they emphasize that these actions should occur more frequently and constantly. Interviewee S3 suggested that "it is necessary to have moments when the teams stop to do field surveys and also training". It was found that in all companies there are forms of creation and knowledge conveyance: The following moments in which creation and conveyance of knowledge occur in companies were highlighted: interaction between individuals in the multidisciplinary teams, routines of meetings to present the collection (all companies), presenting the collection to the commercial representatives (H and I) or sales teams (J, G) and the layout of work in islands (company F). Belkadi et al. (2007) see design as a complex activity that integrates heterogeneous knowledge, generating new knowledge. This sharing of actions and activities among individuals also helps create organizational routines (MICHAUX, 2009), developing specific knowledge in the companies, tracing specific paths, encouraging collective learning and broadening possible collective and organizational competences that are specific to each organization. Bertola and Teixeira (2003) and Capaldo (2007) relate knowledge to the occurrence of routines, organizational processes and practices, and these are favorable moments to share knowledge.

Most of the companies (A, C, D, E, H, I and J) do not realize the importance of transforming tacit into explicit knowledge, since they did not emphasize this practice in their utterances. According to Nonaka (1991), the transformation of individual knowledge into a resource available to others in the organization is the core activity of a company that creates knowledge.

When asked about the knowledge appropriate to a design professional, specialists pointed out that this individual should have certain knowledge. They also highlighted the importance of knowledge in different areas, besides understanding the entire development process of products of the organization. On the other hand, the design professionals of the

companies interviewed mentioned technical, management, design, marketing, sewing, pilot work and modeling knowledge as well as production and market as determinant information for the design professional who will move within the product development process, whether they be a designer, stylist, style director or design manager. Belkadi et al. (2007) emphasize that design can be interpreted as an activity that can generate new knowledge and integrate heterogeneous knowledge.

4.5 COMMUNICATION, INTERACTIONS AND LEARNING

According to the design professionals of companies B, C, F and I, the design, marketing and purchasing departments should work in an interconnected fashion, so that evolution and harmony will occur from the time of creation until the collection is validated for production. Jevnaker (1993) points out the importance of interactions between design, marketing and business strategy. Girard and Robin (2006) corroborate this, saying that cooperation among the participants in a given project directly helps improve the team performance in seeking the competitive advantage that can be sustained in the organizations. Alegre and Chiva (2008) list other interactions, such as: experimenting, dialogue and connection with the outside environment. Specialists S1 and S3 highlighted the importance of field surveys for initial contact with the market. Specialists S2 and S4 added to it mentioning the importance of contacts of design professionals with the end consumer at the point of sale. The design professionals of the companies B, E and G also pointed out these moments as essential to follow the performance of the pieces created, monitoring their acceptance by the end consumers. According to Riel, Tichkiewitch and Messnarz (2010), the communication of participants in a project with various expertises generates a rich exchange of information and knowledge. This communication can occur by exchanging information structured by an organizational architecture, (BONJOUR; MICAELLI, 2010) and by internal communication itself (PERKS; COOPER; JONES, 2005; MOULTRIE; CLARKSON; PROBERT, 2007).

The specialists emphasized that it is essential to have moments of learning, and also continuous communication among the individuals belonging to the design team and among the teams, for design management to occur. The companies say that they value and encourage learning by design professionals, be it through courses and training events (B, C, G), travel (B, D, G) and workshops (A, B, C, G). In-house learning among the employees was highlighted as essential by companies A, B, D, E, F, G, I and J. Often, the conveyance of tacit knowledge from one professional to another occurs based on this learning (NONAKA, 1991), by training sessions, meetings or even along with the routines and work processes.

Sharing knowledge (OSTERLUND; LOVEN, 2005; RIEL; TICHKIEWITCH; MESSNARZ, 2010; BONJOUR; MICAELLI, 2010) and, more specifically, sharing expertise, knowledge, during the design process engineering, collaborative knowledge, know-how and knowledge related to the development of communication generate a number of items of information and new knowledge (ROBIN; ROSE; GIRARD, 2007). Riel, Tichkiewitch and Messnarz (2010) emphasize that the organization of learning creates a positive culture of learning and synergy, in which it is possible to learn from mistakes with the team. Osterlund and Loven (2005) say that organizational learning is an essential condition to achieve change and that it is necessary for the company to create the conditions for in-house learning to occur.

5 CONCLUSIONS

The objective of this article was to investigate the specialists' view of competences in design management, joints and intervenient factors in Brazilian fashion industry. Another objective is to get to know how the design teams are structured and their relationship with the organization.

As shown, the garment industry in the southern region of Brazil is highly representative in the economic and social context of the country, although it presents a vast field for the development of design management as well as viewing design as a strategic element for sustainable competitive advantage.

Thus, in the garment companies, the creation and occurrence of knowledge and information is clearly perceived, be it from individual practices and routines, or even from the integration of work teams. In-house arrangements, work routines and a system of processes might help map these occurrences making it possible to manage the activities and resources (tangible and intangible) involved in design management.

The definition of phases and design professional activities, the mapping of stakeholders involved in the process, and related competences contribute in a practical way for the garment industry and the academic community. Identification of activities and actors involved in determinants phases contribute to the occurrence of design management and design seen as a strategic element in organizations. Added to this, the mapping of competences enables the articulation and development of these in individual, collective and organizational level, collaborating on integration and training of individuals and teams for the occurrence of design management.

The research has the limitation to be applied in ten cases studies, so it is not possible to generalize the results and conclusions obtained in the garment industry as a whole. Consequently, it is suggested further research studies in a larger sample of companies in this segment, through a quantitative research on companies located in the southern region, or in other regions of Brazil.

CONTRIBUTION BY THE AUTHORS

Claudia de Souza Libânio contributed draft the literature review method, interviews with experts, collection and analysis of data, results, discussion and conclusion.

Fernando Gonçalves Amaral contributed to the development and review of the method, the analysis of results and in the overall review of the article.

REFERENCES

ABRAVEST. Associação Brasileira da Indústria do Vestuário. **Dados estatísticos do setor do vestuário**. 2015. Disponível em: <www.abravest.org.br>. Acesso em: 03 jul. 2015.

ALEGRE, J.; CHIVA, R. Assessing the impact of organizational learning capability on product innovation performance: an empirical test. **Technovation**, v. 28, p. 315–326, 2008.

BARDIN, L. **L'analyse de contenu**. Paris: Presses Universitaires de France, 2013.

BELKADI, F. et al. Competency characterization by means of work situation modeling. **Computers in Industry**, v. 58, p. 164-178, 2007.

BERTOLA, P.; TEIXEIRA, J. C. Design as a knowledge agent: How design as a knowledge process is embedded into organizations to foster innovation. **Design Studies**, v. 24, n. 2, p. 181-194, 2003.

BEST, K. **Design management**: managing design strategy, process and implementation. Ava, Switzerland, 2006.

BONJOUR, E.; MICAELLI, J. P. Design core competence diagnosis: a case from the automotive industry**. IEEE - Transactions on Engineering Management**, v. 57, n. 2, 2010.

BORJA DE MOZOTA, B. **Design management**: using design to build brand value and corporate innovation. New York: Allworth, 2003.

BROWN, P. Do senior management development programmes enhance strategic management capabilities? **Strategic Change**, v. 15, p. 37–45, 2006.

BRUCE, M. et al. Effective design management for small businesses. **Design Studies**, v. 20, 1999.

CAPALDO, A. Network structure and innovation: the leveraging of a dual network as a distinctive relational capability. **Strategic Management Journal**, v. 28, p. 585–608, 2007.

GANDER, J. et al. A paradox of alliance management: resource contamination in the recorded music industry. **Journal of Organizational Behavior**, v. 28, p. 607–624, 2007.

GIL, A. C. **Como elaborar projetos de pesquisa**. 4. ed. São Paulo: Atlas, 2002.

GIRARD, P.; ROBIN, V. Analysis of collaboration for project design management. **Computers in Industry**, v. 57, p. 817-826, 2006.

JEVNAKER, B. H. Inaugurative learning: adapting a new design approach. **Design Studies**, v. 14, n. 4, 1993.

KLEINSMANN, M.; VALKENBURG, R. Barriers and enablers for creating shared understanding in co-design projects. **Design Studies**, v. 29, p. 369-386, 2008.

LAUCHE, K. Job design for good design practice. **Design Studies**, 26, 191-213, 2005.

LEE, K. C. K.; CASSIDY, T. Principles of design leadership for industrial design teams in Taiwan. **Design Studies**, v. 28, p. 437-462, 2007.

LIBÂNIO, C. S.; AMARAL, F. G. Design professionals involved in design management: roles and interactions in different scenarios: a systematic review. In: CHAKRABARTI, A.; PRAKASH, R.V. (Eds.). **Lecture notes in mechanical engineering**. Mumbai: Springer India, 2013.

MALHOTRA, N. **Marketing research**: an applied orientation. 6. ed. Pearson, 2009.

MICHAUX, V. Articuler les compétences individuelle, collective, organisationnelle et stratégique: les éclairages de la théorie des ressources et du capital social. In: RETOUR, D.; PICQ, T.; DEFELIX, C. (Eds.). **Gestion des compétences**: nouvelles relations nouvelles dimensions. Paris: Vuibert, 2009. p.13-33.

MISHRA, A. A.; SHAH, R. In union lies strength: collaborative competence in new product development and its performance effects. **Journal of Operations Management**, v. 27, p. 324–338, 2009.

MOULTRIE, J.; CLARKSON, P.J.; PROBERT, D. Development of a design audit tool for SMEs. **The Journal of Product Innovation Management**, v. 24, p. 335–368, 2007.

NONAKA, I. The knowledge-creating company. **Harvard Business Review**, v. 69, n. 6, p. 96-104, 1991.

OSTERLUND, J.; LOVEN, E. Information versus inertia: a model for product change with low inertia. **Systems Research and Behavioral Science**, v. 22, p. 547-560, 2005.

PERKS, H.; COOPER, R.; JONES, C. Characterizing the role of design in new product development: an empirically derived taxonomy. **The Journal of Product Innovation Management**, v. 22, p. 111–127, 2005.

PRADO, M. V. (Org.). (2010). **Brasil têxtil 2010**: relatório setorial da indústria têxtil brasileira. São Paulo: IEMI, 2010.

RAVASI, D.; LOJACONO, G. Managing design and designers for strategic renewal. **Long Range Planning**, v. 38, p. 51-77, 2005.

REID, F. J. M. et al. The management of electronics engineering design teams: linking tactics to changing conditions. **Design Studies**, v. 21, p. 75-97, 2000.

RETOUR, D. Progressos e limites da gestão por competências na França. In: DUTRA, J.S.; FLEURY, M. T. L.; RUAS, R. **Competências**: conceitos, métodos e experiências. São Paulo: Atlas, 2012.

RETOUR, D.; KROHMER, C. La compétence collective comme maillon clé de la gestion des competences. In: DEFELIX, C.; KLASFERD, A.; OIRY, E. **Nouveaux regards sur la gestion des compétences**. Paris: Vuibert, 2006. p.149-183.

RIEL, A.; TICHKIEWITCH, S.; MESSNARZ, R. Qualification and certification for the competitive edge in integrated design. **CIRP Journal of Manufacturing Science and Technology**, v. 2, p. 279–289, 2010.

ROBIN, V.; ROSE, B.; GIRARD, P. Modelling collaborative knowledge to support engineering design project manager. **Computers in Industry**, v. 58, p. 188–198, 2007.

RUAS, R. L. Gestão por competências: uma contribuição à estratégia das organizações. In: RUAS, R. L.; ANTONELLO, C. S.; BOFF, L. H. **Os novos horizontes da gestão**: aprendizagem organizacional e competências. Porto Alegre: Bookman, 2005.

RUAS, R. L. **Competências**: compartilhando conceitos e noções. Porto Alegre: Mimeo, 2009.

YIN, R. K. **Estudo de caso**: planejamento e métodos. 2. ed. Porto Alegre: Bookman, 2001.