


A Project Guide as a tool to improve the design process in a metal-mechanic industry in the city of Caruaru-PE

O guia de projeto como ferramenta de aperfeiçoamento do processo de design em uma indústria metalmeccânica na cidade de Caruaru (PE)

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ABSTRACT

This article introduces the result of a theoretical-practical action to improve the design process of a metallurgical industry in the city of Caruaru-PE. The recurrence of misunderstandings among the company's sectors, the delay in deliveries, and order returns were the arguments for the first impressions about the lack of information in the initial phase of the design process. To optimize the execution of product projects, we proposed a briefing based on a collaborative method comprised of three macro steps: 1. Mapping the productive capacity of the company's industrial park; 2. Individual interviews and group work sessions to investigate the difficulties of each sector; 3. Understanding the profile and demands of the company's main customers. In a co-creation process, it was possible to synthesize the results into a Design Project Guide that is currently being tested to evaluate its effectiveness.

Keywords: Metallurgy. Briefing. Product design.

RESUMO

Este artigo apresenta o resultado de uma ação teórico-prática para o aperfeiçoamento do processo de design de produto de uma indústria metalúrgica da cidade de Caruaru (PE). A frequência de retrabalhos, os atrasos nas entregas dos pedidos e a recorrência de mal-entendidos entre os setores da empresa foram as primeiras impressões sobre carência de dados na prática projetual da empresa. Para otimizar a execução dos projetos de produtos, um instrumento de briefing foi proposto mediante um método colaborativo composto de três macroetapas: mapeamento da capacidade produtiva do parque industrial da empresa; entrevistas individuais e sessões de trabalho para levantamento das dificuldades dos setores envolvidos no processo de design; e compreensão do perfil e das demandas dos principais clientes. Como resultado, foi possível sintetizar as informações em um guia de projeto que atualmente vem sendo testado para avaliação de sua eficácia.

Palavras-chave: Metalurgia. Briefing. Design de produto.

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RECOGNIZING CONTEXT: INTRODUCTION

From the economical point of view, the data from *Portal da Indústria* (2020) show that the industry sector is responsible for 19.7% of the gross domestic product (GDP) in the state of Pernambuco, which corresponds to R\$ 33.4 billion. According to data from *Portal da Indústria* (2020) in 2020, there were 12,497 industries that employed 273,972 workers in the state. These data not only show the potential of the industry in the state, but also reveal opportunities for jobs and development of innovative projects for young designers in Pernambuco.

However, the main obstacle for design to be an agent of transformation in the state's industry is that employers are usually unaware of the benefits that can be generated by design concerning product development, the company's communication, and production management (SILVA; ANDRADE; CAVALCANTI, 2018).

According to Phillips (2008), employers will stop taking design for granted when they understand how it can help them reach their businesses' goals. Therefore, it is up to the designers to broadcast the range of design, since it is not limited to creativity or to aesthetic aspects; it can also solve problems for businesses.

In 2017, the staff of O Imaginário¹ laboratory, from Universidade Federal de Pernambuco (UFPE), provoked company A² to formalize a partnership aiming at developing a pilot teaching and extension project that could relate the fields of product design and project management in transformation industries of the *Agreste* region of the state of Pernambuco. In the industrial scope, the laboratory's actions aimed at strengthening the articulation between the university with the production sector, in order to exchange information between the Academy and the companies, thus increasing the job possibilities for designers in the state (ANDRADE; CAVALCANTI, 2020).

For 12 months, design concepts and tools that led to significant improvements in the layout of machines and equipment, systematization of the technical design of existing products, analysis of production costs, as well as the proposition of a maintenance plan for the machinery were discussed with collaborators. The partnership with the university has brought about a new vision towards the process of product development in the company.

In the past, the process of creating and managing production was exclusively a responsibility of the production manager, who was the main person in charge of consolidating the company in the commercial segment, thus dominating the know-how regarding the fabrication of furniture for stores, drugstores, and warehouses;

1 It is a laboratory of research and multidisciplinary extension related to the Design and Culture Department at UFPE, developed by professionals, professors and students from several fields of knowledge who work with design as an instrument that serves environmental, economic and social sustainability.

2 In this study, company A is a mechanical processing industry of carbon steel into consumer goods located in the city of Caruaru, in the *Agreste* region of Pernambuco. It has been working for over two decades in the field of commercial exhibitors, with more than 190 clients distributed in the North and Northeast regions of Brazil.

however, there was a latent desire from the board to develop and produce furniture for the residential segment.

Thus, stimulated by the positive results perceived by the design actions, the company hired three new collaborators to meet the demands of product project, both for the commercial area and the new line of residential products. They hired a trainee and two interns: one for design and another one for production engineering.

But it was only possible to observe that the practice was filled with misunderstandings in a real product project demand for the residential segment. The following was observed: rework in production processes, delayed scheduled of order deliveries, generating financial losses, besides negative impacts on the company's reputation. This problem was discussed in many work meetings involving the sectors connected to the development process, including a discussion about the need to create a documental briefing to support the process. Thus, this study presents the methodological pathway performed to design the project guide in co-participation; an internal communication tool for the improvement of the design project process of company A's product.

THEORETICAL REFERENCE

The reality about design management in the industries of Caruaru

According to Wolff (2010), design management is the application of design principles as a tool for business management, affecting the planning, the production and the commercialization of products and services to reach the strategic goals of the company. Therefore, design management can improve the performance of a process, a product, of the market or the experience of the user/consumer.

There are many ways to analyze the level of design performance in the corporate environment. According to Joziassé (2000 *apud* GARCIA, 2019) and Martins (2004 *apud* CABRAL, 2008), design management can be divided in three levels: operational, tactic and strategic.

The operational level is the execution of the design project, which results in a physical or digital product. According to Mozota (2010 *apud* GARCIA, 2019), at this level it is possible to create value in the development of a product through perceived market differentiation. The tactic level is the one that ensures design activities are being developed efficiently, making sure that the procedures, rules, and design processes are known by the entire design staff. Also called functional design, it is the level that creates value in the coordination and management activities, thus improving design processes and tools. And design management at the strategic level is the one that makes decisions about the company's direction, in charge of evaluating the need to create a specific product or service. That is, the design is responsible for a continuous vanguard process, anticipating trends and making decisions about internal and external matters of the business.

The creation of the residential line of products began without a well-established briefing. There was little information about the market and its target-audience, the

deadline was extremely close, and the urgency from the board was high. Baxter (2000) clarifies about the risk of that practice:

The products that start with good specification, discussed and agreed upon among all people who make decisions in the company, and whose early stages of development are followed-up, have three times more chances of success than those with vague specifications or poorly made initial follow-up (BAXTER, 2000, p. 23).

Therefore, it was observed that such an approach for project development was inadequate. So, in order for that isolated episode not to become a routine activity, based on Phillips (2008), the newly hired design sector presented the important concepts and aspects about the composition of a briefing and how it should be implanted in the project development processes of companies. All leaders in the sectors responsible for the manufacturing process were involved in the process of creation to stimulate a collaborative culture. It was the first attempt to take design management beyond the operational level, improving the project tools and practices in company A.

According to Libânio (2011), the incorporation of design management in the corporate environment happens gradually and requires the co-participation of multidisciplinary collaborators. The stimulus to the communication of different teams should also be provoked, since it encourages internal entrepreneurship, in order to propose changes and essential improvements for the company's success.

Why do we still need to talk about *briefing*?

The starting point of the design process is to identify the problem, which should be described in the project's scope. The origin of the word "brief" is English, and it means "written summary" (PAZMINO, 2015). In a successful design project there is usually a briefing, that is, a concrete and concise scope (LUPTON, 2013, p. 56).

Bruce, Cooper and Vazques (1999 *apud* VIARO; BERNARDES; SILVA, 2014) also state that for the designers to produce an efficient solution to work with the client, they need to collect a series of explicit information about marketing, details about the mode of production, planning, and schedule.

The *briefing* is a document that contains the project's needs and restrictions, approaching information about the product, the market and the project's differentials and strategies. It can be used as an agreement or formal contract between the requester and the designer. It can also work as a script, schedule or follow-up and evaluation instrument (PHILLIPS, 2008). The oral *briefings* may lead to misunderstandings, confusion, discussion, and confrontation. Therefore, the recommendation is that the project scope be written and available in printed and digital means (PAZMINO, 2015; PHILLIPS, 2008).

There is no formula for the construction of a briefing, but aspects that should be essential for its elaboration (Chart 1). "The most important thing is that the

Chart 1. Essential aspects of a *briefing*.

Basic topics	Content
Nature of the project and content	Justification; project's objective; expected results; responsibilities of the project
Sectoral analysis	List of products; competitors; prices and promotions; brand; trends; company's strategy
Target-audience	Characteristics of the target-audience; cultural and regional differences and consumption habits
Company's portfolio	Brand; corporate image; market segmentation
Business goals and design strategies	Results considering the project described in the business language
Objective, deadline and project budget	Description and specification; foreseen duration; budget; necessary human resources and responsibilities
Approval, implementation and evaluation	Responsible for the approval; steps for implementation; criteria to evaluate success
Research information	Business trends; technological advances; product launch
Appendix	Supplementary materials

Source: adapted from Phillips (2008).

briefing contains all relevant information for the project's stakeholders" (PHILLIPS, 2008, p. 2, emphasis in the original).

Many businessmen in small and mid-sized companies of the Brazilian Northeast wish to use design to increase their commercial advantage by reaching new markets. However, most of them are not aware that it is necessary to go through a planning process to launch a new product. It is hard to explain to the local businessmen that it is necessary to invest a great amount of time in the pre-project phase, and that the non-fulfilling of this stage may jeopardize the entire project. This was the reality of company A before the pilot project experience with the university. The confidence relationship established between the O Imaginário laboratory and company A created a favorable environment for the implementation of design actions.

METHODOLOGICAL STRATEGY

To reach the goal of improving the project process of company A's product, a methodological strategy was designed in three macrophases (Figure 1).

Stage 1 consisted of mapping of the company's industrial park by listing and describing the elements that compose the manufacturing system: raw material, machinery and the company's main products. Photographs were taken, and the company's industrial park was systematically observed; then, there were unstructured interviews and meetings with the parties in the manufacture sector: sheet; wiring; mesh, painting and packaging. This analysis was relevant for recognizing the potential and the technological limitations of the company, so as to minimize the errors in projects and to search for solutions that could optimize the production process.

Stage 1 aimed at understanding the needs and promoting more engagement among the eight employees (leaders) distributed in the commercial, design,

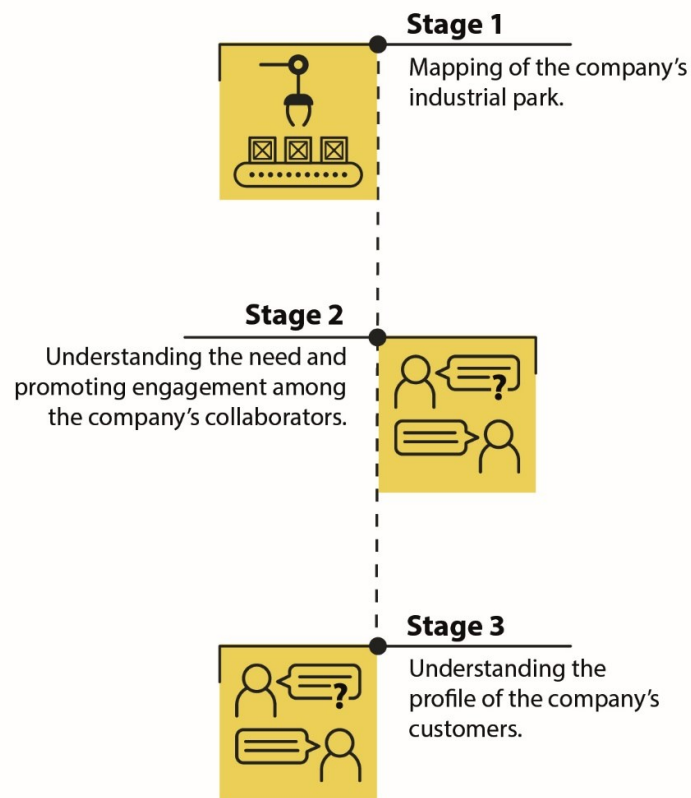


Figure 1. Design of the methodological strategy.

purchase and manufacture sectors of the company. The individual semi-structured interviews were carried out, followed by work sessions to establish the demands.

Stage 3 aimed at understanding the customer profile of the market with structured interviews guided by a form. According to the sales reports, from January to September, 2019 the company established commercial relations with 191 clients.

Because of the large number of clients, in partnership with the commercial sector, a sample plan was elaborated with the main clients of each segment: wholesale (4); shelves (5); residential (1); services (1); and displays/booths (4) (Chart 2). Of the 15 main clients that were contacted, only nine were available to collaborate with the action: wholesale (2); shelves (2); services (1); and displays/booths (4). Unfortunately, the residential clients were not activated because the company did not have their contact (only through the mediation of sales representatives).

Chart 2. Sample plans of interviews per segment.

Market segment	Amount	Sample	Interviews
Wholesale	75	4	2
Shelves	77	5	2
Residential	6	1	-
Services	15	1	1
<i>Displays/booths</i>	18	4	4
TOTAL	191	15	9

Before the form was applied, a pilot test was carried out with one client from each group in order to verify opportunities for improvements in the interview protocol. The concluded forms enabled going to the field for the interviews. At first, the internal sectors of the company were interviewed, and then the interviews were addressed to the clients.

The interviews were previously scheduled with each collaborator, and carried out on site, individually. During their execution, neutrality was the focus in order not to induce the responses of the interviewees. The first contact with clients took place by WhatsApp, with an explanatory message about the purpose of the action, the approximate duration of the interview and the best day and time for the interview to take place on the phone.

DATA COLLECTION AND ANALYSIS

Mapping of the technological park in company A

The company's layout is divided in six sheds (Figure 2): (1) company's management, which is composed of the subsectors of corporate management, purchase, sales, financing and human resources; 2) dispatch; (3) painting, which also includes the washing of pieces; (4) electroplating, which also includes an attached area for polishing; (5) and production, separated in the sectors of the mesh, tubes, sheet, weld, tooling, warehouse, design and production engineering.



Figure 2. Factory layout.

The company's production process will be presented to contextualize its activities, based on its production system: raw materials' arrival, manufacturing processes and product dispatch.

Raw material's arrival

Company A uses two main types of raw material to manufacture its items: carbon steel and wood. Steel can be found in hot or cold metal sheet profiles, industrial tubes or low carbon content (LCC) wire. Each sector works with a different steel profile, and that is why each of them has its specific raw material storage.

The tube sector uses steel in profiles of mechanic industrial tubes, and it can present cross-sectional, rectangular or square cuts. The tubes are obtained in tons,

and each unitary section measures 6 thousand mm in length; its unitary weight depends on the diameter and thickness of its gauge.

The main raw material in the mesh sector is BTC wire, which is provided in a 200 kg roll, with internal diameter of 500 mm and external diameter of 800 mm. The most commonly used wire diameter in the sector may range: 2.11, 2.75, 4, 5 and 6 mm.

For the production in the sheet sector, the raw material is the hot rolled sheet or the cold rolled sheet. The difference between them concerns their manufacturing process, specifically the temperature in which they are shaped. The cold rolled sheet is produced at a temperature below 100°C. The hot rolled sheet is manufactured at temperatures higher than 900°C.

The materials used in the carpentry sector consist of: medium density fiberboard (MDF) sheets; plywood sheets; expanding foam; and glass. The most commonly used measures of thickness (in mm) of MDF sheets in the sector are: 3, 6, 9, 15, 18 and 20.

Manufacturing processes

One product usually has several components that integrate its structure, and the manufacturing of each component involves different processes, machinery and manpower. Most of the factory's equipment is not automatized, thus depending on great human effort for operation, which limits the productive efficiency and increases the risk of work-related diseases due to repeated effort and inadequate posture during the workday.

The main mechanical transformation production processes are: cutting, stamping, emery, folding and, finally, welding, which is the main process applied by the company to connect the products' components. The pieces that are finalized in the mesh, sheet and tube and that require welding are placed in intermediate storages so that they can be connected through the metal inert gas (MIG) welding process (Figure 3).



Figure 3. Welding process.

As soon as the whole manufacturing process in the production sectors are concluded, the pieces are sent to one of the surface treatment sectors: painting or electroplating, according to the project specifications.

Before the painting process *per se*, it is necessary to wash the pieces chemically to remove residue and specks from manufacturing. The washing is carried out in nine tanks that conduct the processes of degrease, phosphatization, passivation, refinement and water washing.

After being washed, the pieces are sent to electrostatic painting. The process is cyclic, so there are two cycles conducted by a conveyor belt; the first lap leads to the drying oven, and the second one, to painting.

The electroplating process also requires a cleaning step before being carried out. This process takes place in a connecting room and uses a sanding machine to remove the specks and to make the surface plain, so there are no areas susceptible to oxidation after the application of chrome.

Electroplating is an electrolytic process of recovering metallic pieces with another metal or alloy. In company A, this process takes place by immersing the steel pieces in successive baths. The first one is called degreasing. Then there comes acid chloride, caustic soda, sulfuric acid, nickel, chrome and, finally, water (Figure 4). The whole surface treatment process takes 2 hours, in average, and aims at reducing the natural oxidation of steel, increasing the life cycle of the final product.



Figure 4. Bath tanks for the electroplating process.

After surface treatment, the components of the product are sent to the dispatch sector for packaging. Some items are packed manually, and others with a semiautomatic vacuum machine.

Product dispatch

The company is in the *Agreste* region of Pernambuco, which has one of the largest clothing poles in Brazil. It meets the demand of commercial furniture, such as clothes racks, RTs and rack scales (Figura 5A), to compose the clothing stores of the region and the fair clients by producing baskets, folding screens and displays.



Source: company's files.

Figure 5. Example of products from the comercial line.

Besides, the business line includes projects for special, tailor-made displays and booths (Figure 5B). The company has the following clients for these projects: Vitamassa, Luzarte Estrela, Kivita Alimentos, Tramontina, among others. Finally, it works with the segment of shelves, creating projects to furnish markets and drug-stores, working with the client's layout to expose the products the best possible way (Figure 5C).

After having become a reference in quality of business products, the company has improved the production capacity of its industrial park and taken initiative to become a reference in the production of residential products (Figure 6).



Source: company's files.

Figure 6. Example of residential products developed by the design team.

The design sector created a series of products for this new market; however, two factors prevented the implantation of this new stage for the company: the high demand for business line products and the restrictions imposed by the COVID-19 pandemic.

Conversation with Company A's leading collaborators and clients

To understand the project demands of the sectors involved in the process of product projects, and to understand the clients' needs, four forms were elaborated — one for each group involved in the design process —, with a script of semi-structured questions.

It took about one week to elaborate all protocols. Then, it was determined that before using them on the entire sample, it would be important to test them with one representative from each group. The test and the changes in protocol took another week. Each interview lasted, in average, 15 minutes. Now, the results of this process will be presented.

Commercial sector

The first part of the interview with the employees in the commercial sector aimed at knowing the employees' jobs, time of work and skills related to the job. The sector has three employees: two salespeople and one business manager. They have all had these positions for two years, and described their activities as follows:

- To attract and maintain a good relationship with customers;
- To make internal and external sales;
- To analyze the weekly sales;
- To search for new possible customers;
- To follow-up on the orders;
- To elaborate budgets and negotiate;
- To develop a product launch research;

Regarding the sales process, the clients can be approached by telesales or visits to their businesses.

For product projects, there are two possible ways: if the client already has the project, including technical details of the product to be manufactured, this project is directly sent to the costs sector; if the client does not have the project, the need for it is investigated by collecting information about:

- Business, structure, dimensions, information about when the client intends to start the business;
- Measurements and color;
- Need for the project and cost-benefit for the client.

When asked about how the collected information is passed on to the other sectors, the response was that the information verified with clients are sent in a

draft with images of similar products and predefined measures for the client via e-mail, WhatsApp or paper.

One of the main difficulties reported in the sales process regarded the time available to present the prototype to the client. According to the interviewees, delays in this process halt the negotiation. One possible solution would be the existence of a manufacturing sector focused on the confection of prototypes.

Finally, all interviewees reported not knowing about the briefing process, and even after a brief explanation and questioning about whether they knew it by another name, the answer was that they did not know it with any other name. However, they understood the process as a conversation to understand the client's need.

Design sector

The interview with the design sector was conducted with the design intern, who had been in the company for two months, and the production manager, with 15 years of experience on the job. According to the intern, her job includes: product project, elaboration of renders, technical detailing and production follow-up of new products.

The activities described by the production manager are: follow-up the production performance, study improvements for the processes, analyze productivity and motivation of collaborators, follow-up the orders, accompany the maintenance of the company's machinery and manufacture machines to improve production.

According to the interviewees, the demand for new projects is delivered by the commercial sector and the mean weekly frequency is of one to three projects.

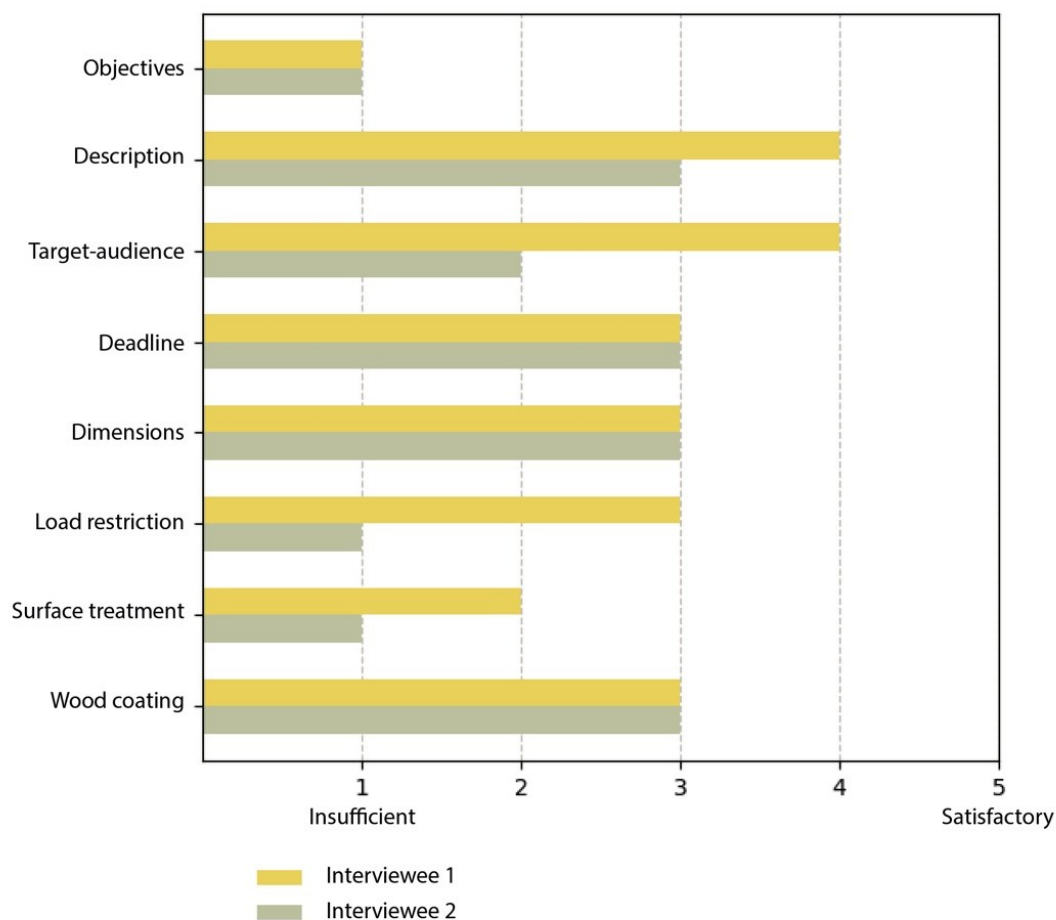
In the second moment of the interview, every interviewee was asked to evaluate, in a scale of 1 to 5 (being 1 insufficient; and 5, satisfactory), the information received from the internal customer regarding a series of important information for product development (Graph 1).

The difficulties presented by the interviewees of the design sector were:

- Little room for creativity;
- Strong reference about the products;
- Culture of copying;
- Short deadline;
- The material specified in the project is not found in the local market.

For the interviewees, the possible solutions for these difficulties would be market research about the local offer of materials and supplies, awareness about the design process, a more structured briefing, planning of product launches and, finally, understanding and separating the segments of product lines, with different approaches for each segment.

Only the intern knew what briefing was. She defined it as a path with questions to identify the demands, wishes that one wants to accomplish with the project. The production manager was not familiar with the term, however, he knew about the process.



Graph 1. Evaluation of project information.

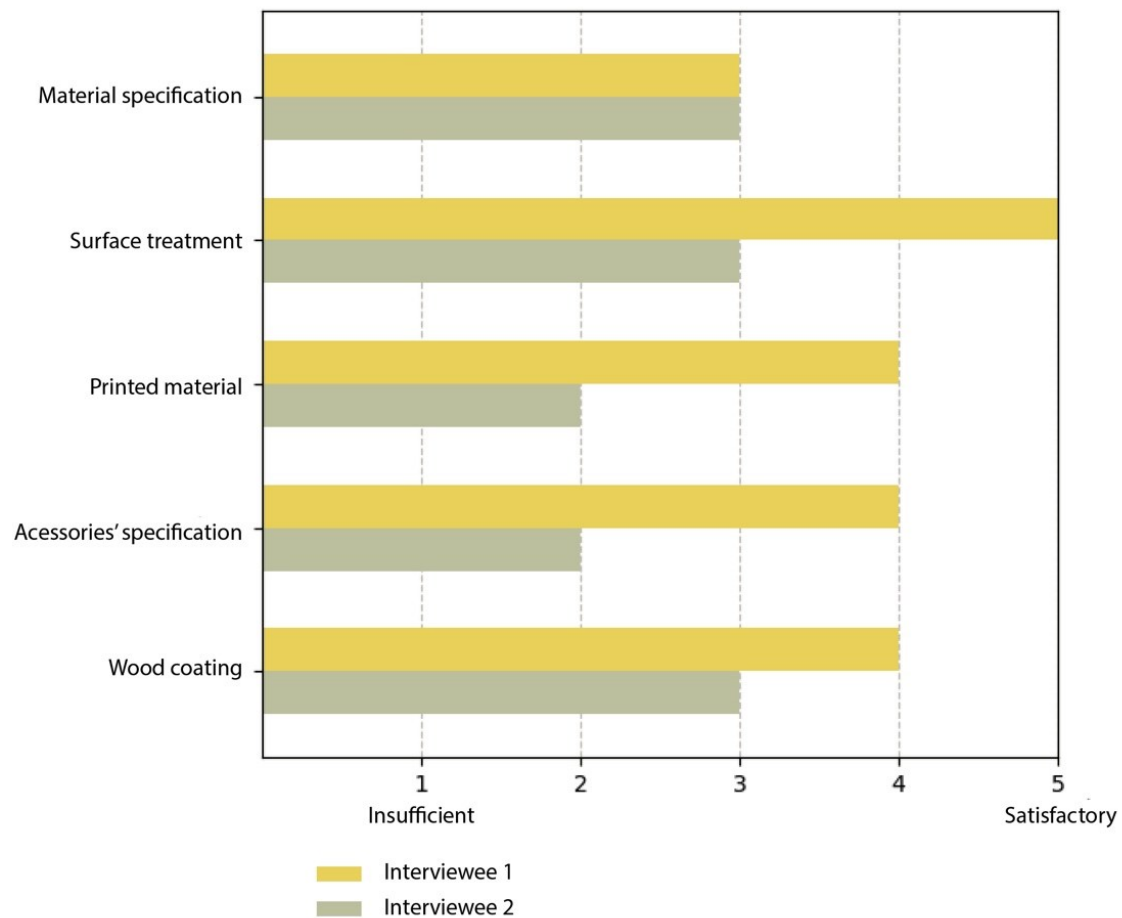
Costs sector

The interview of the costs sector was performed with the production planning and control technician, who had been in company A for 11 years, and is in charge of estimating price, planning, production control and cost reduction in the production sector. The interview was also conducted with a service supplier that has worked in the company for seven years, and has acted in many different sectors, including costs.

According to the interviewees, the demand for new projects can be delivered with weekly mean frequency of one to five projects. Then, interviewees were asked to assess the information they received from their internal client in a scale from 1 to 5, being 1 insufficient, and 5, satisfactory (Graph 2).

When asked about which other information the interviewees considered necessary to calculate the project budgets, the importance of the technical design of the product was emphasized, as well as a minimum deadline stipulated according to the demand of activities.

Besides the difficulties and possible solutions observed in the new products' project, the interviewees complained about the lack of information passed on to the sectors. Also, they mentioned that these difficulties could be solved with more specific project detailing and more efficient data collection.



Graph 2. Data of the evaluation about the information in the project scope.

None of the interviewees knew what briefing was, and after a brief explanation, they claimed to have understood the process; however, they did not know it with this specific name.

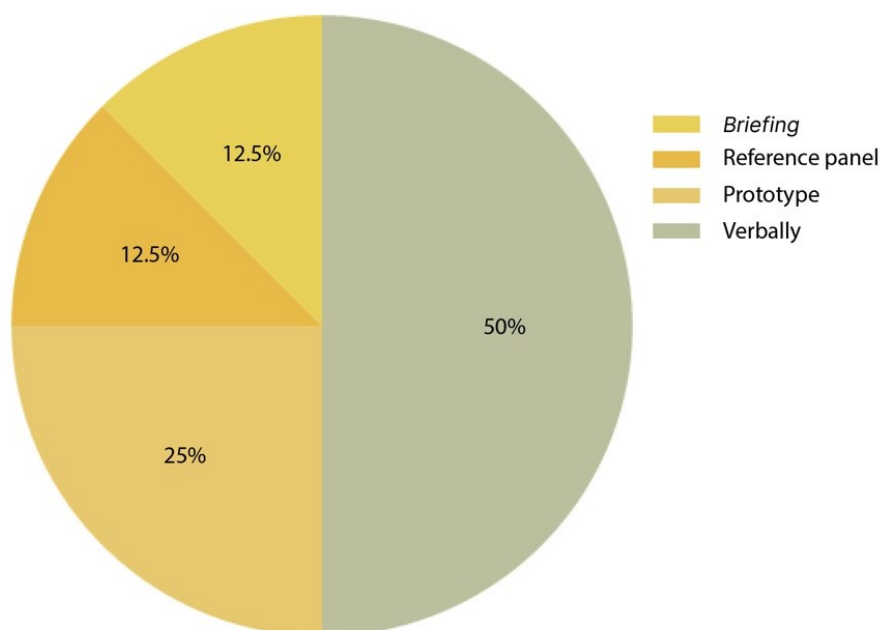
Customers

The first part of the interview with customers aimed at identifying information about their profile, with questions concerning their businesses and how they knew the company. Of the nine interviewed customers, two were in the wholesale business; two, shelves; one, service; and four, displays/booths.

The second section of the questionnaire aimed at knowing whether the client had purchased a new product for the company. Of the nine interviewees, only one had never requested the new project. Since the company works with different segments, the request for new products described by these clients included different sizes of clothes racks, booths, layout of business establishments and table bases.

The interviews aimed at identifying if there was a pattern about how the information on these customized products were passed on to the commercial sector. According to the reports, four of the eight clients who requested new orders

gave the project information only verbally; two of them delivered a prototype for budgeting and confection of a sample; one delivered images of similar products for the salesperson; and another one visited the company with samples of the products he wanted to expose, and discussed his need directly with the company's creative sector (Graph 3).



Graph 3. Transmission of information about new projects.

Regarding the information made available during the project request, the clients answered that they shared the general dimensions of the product, image panel, type of intended service (in case of booths), indication of colors to be applied on the surface.

According to five clients, the project information was not registered in any physical and/or digital document. For these customers, the only record of information sharing was verbal. Of the three other clients, two mentioned having received images for the approval of the project by e-mail, and another one, by WhatsApp.

Then, the client could indicate his satisfaction in a scale from 1 to 5, being 1: dissatisfied; and 5, exceeded my expectations – regarding the quality of the product. Of the nine interviewed customers, eight assessed the quality of products with the maximum score (5), and only one assessed it with 4.

Finally, the customers could expose difficulties and suggestions for improvements. Of the nine interviewed customers, seven claimed not having had any type of difficulty; one client reported lack of raw material to produce the order; and another one informed delay for the company to assemble the store. As suggestions, we obtained:

- More efficient communication with the customer, transparency about delays;
- Employee training/courses to assemble the shelves;
- Improve the quality of printing (graphics);

- The second level beam of the parade clothing rack could be packed with the rack, not as a separate product;
- To improve the quality of the weld.

RESULT: THE *DESIGN* PROJECT GUIDE

Company A has physical structure, with a variety of machines and staff that allow it to produce products for five commercial segments: wholesale, shelves, services, residential, displays/booths.

Regarding the process of product development, of the eight collaborators involved in the process, only one knew what briefing was; however, this was not a critical point, since the process can be known with a different name; the most important thing is that it be conducted efficiently.

The company does not have a standard approach for the project scope, nor a formal record in an electronic and/or physical document. Besides the superficial data collection, there were complaints about the lack of data passed on to the design and costs sectors.

Concerning the deadline, it was observed that salespeople reported the stipulation of a deadline according to the complexity of the project; however, besides doing it even before presenting the project to the team of design and production, this demand was usually transmitted urgently, which can cause stress on the collaborators due to the pressure of receiving a request and not having the time to at least think about the project.

Finally, even though the clients were satisfied, they made some suggestions regarding communication and transparency.

After the crossing of data in the field research, it was possible to establish the requirements for the *briefing* protocol:

- The protocol should be written down, and a copy should be available for the parties involved in the creation process;
- Collecting customer information according to what is necessary to include a new customer in the industrial management system;
- Collecting information about the company/client and its products and services;
- Gathering information about the project's objectives and the expected results;
- Highlighting the main competitors and their weaknesses and strengths;
- Presenting the product's target-audience;
- Defining the technical restrictions of the project;
- Stipulating a minimum deadline for partial deliveries to the client, made available according to the person in charge of developing each activity;
- Creating a schedule with the activities and parties in charge of the task and approval, generating a feeling of co-responsibility between the client and the company;
- Attaching extra information, if necessary.

Once the word "briefing" is not known by most of the company's collaborators, the protocol for data collection from clients was called project guide to facilitate the recognition of the process between clients and workers.

Therefore, the project guide was created considering three sessions: the customer's business; the project problem; and the schedule. Then, it is possible to verify the list of tools used for the guide's data collection (Chart 3).

Chart 3. Sections of the project guide.

Section	Tools
Customer's business	General information, portfolio and client's market analysis
Project problem	Identification of the client's target-audience, description of project objectives, description of the project's technical demand
Schedule	Identification of delivery dates and parties in charge of conducting the project in the company

The objective of the first protocol session was to map the information about the business strategy of clients, so that it would be possible to make a design proposal for competitive products aligned with the market segment. For that, it was necessary to collect the registry information of a new client in the company's management system.

The importance of understanding the client's business strategy was observed, so it was necessary to investigate some information about the company's size, its portfolio of products and services. Therefore, we used an adaptation of the SWOT analysis³. These are relevant aspects to consider the current moment, as well as the company's projections and expectations.

In the second session, the goal was to understand the project problem, that is, the product's journey in terms of manufacturing. Once the client was unaware of the productive capacity of company A's industrial park, it was necessary to identify the project's technological needs, such as the project objective, the indication of site of use and intended service. For that stage, it was necessary to investigate the size restrictions, load capacity, type of surface coating, and to identify which were the expected deliveries in terms of physical and graphic products, so that it would be possible to work with the design and engineering team regarding the inputs and necessary processes to produce the project.

Finally, the third session consisted of making a schedule and identifying who were the internal and external clients in charge of executing the project. Then, there was a last page available to attach any extra information, and a panel of images for reference.

The application of the protocol in the company was first carried out in a meeting with the employees involved in the design process, to show a draft of the project guide, to explain the importance of each one of these sessions, and to explain the

³ SWOT means *strengths, weaknesses, opportunities and threat*. It is a planning tool that can be used in moments of decision making, in order to reduce the occurrence of risks and seize the opportunities.

protocol regarding the needs of the sectors and indicating the recommendations of use. Then, the project guide (Figure 7) was elaborated in a graphic software, and some printed copies of the file were available in a folder for the collaborators in the commercial sector; the goal was for them to have easy access to the document during commercial meetings with new possible clients. It was also sent digitally, by e-mail, to the parties in charge of product development.



Figure 7. QR code to consult the project guide.

FINAL CONSIDERATIONS

The project guide was approved by the leaders of the sectors and by the production management of company A, and has been used as a support instrument for the process of product projects in their early stages. It favors the communication and transparency with the company's clients.

The main advantage of the project guide was the gain of trust. The document became the record of a commitment, both concerning the company/customer relationship and the internal communication of the company. The tool is a record that the client's problem has been understood. It promotes discussion, collaboration among the company's sectors and strategic planning for the execution of a more accurate project process, ensuring customer satisfaction.

The project guide demystified the briefing process, which began to be understood as a project tool whose function is to reduce the occurrence of misunderstandings and promote engagement among the interested sectors, preventing rework, besides establishing transparency towards the clients.

Throughout the years when we have been directly connected to company A (from 2017 until the beginning of the COVID-19 pandemic, in April, 2020), it was possible to witness the remarkable change in the culture of design among collaborators. The communication between design and manufacture made not only the board, but also the collaborators, realize the immediate improvements in manufacturing. They all became allies in the purpose of improving the design process when they realized how important the stage of planning and data collection is for the demand.

Finally, the importance of extension actions and partnerships between university and company is reinforced, as a way to show the need for professionalization

in the design sector, especially in small and medium companies, so that the design solutions can be incorporated to the company's projects and processes. This happens considering the company's needs, surpassing the configurations of form and including solutions to improve processes, management and communication.

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