THE VALUE OF DESIGN RESEARCH

STREET FURNITURE FOR VISUALLY IMPAIRED PEOPLE: DIRECTIVE/INDICATIVE SIGNPOSTING

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ABSTRACT

This paper investigates and proposes, based on Emotional Design, Universal Design and Strategic Design, the implementation of the methodologies of these fields, on the development of street furniture for the visually impaired. Herewith, it seeks to establish theoretical arena for the third stage of work. which is the proposal of tactile indicative/directive signalization, focused on making locating easier for the visually impaired, within the principles of "Good Design", that, is, a design which will reach the largest number of users as possible. To achieve this goal, were used steps from Strategic Design: a references research in moodboard was performed, to analyze what has already been present in an international range and which are the needs of the disabled people. From these references, a persona was created; this persona was the focus of researches performed for the establishment of anthropometric needs and of tools for the increase of the independent mobility. Therewith, the intention was to create a product which would awaken emotions through other senses other than vision and which would help the lives of the visually impaired.

Keywords: Strategic Design, Universal Design, Street Furniture

1 INTRODUCTION

Most part of the information about the nature of things from the material world are of a visual scope. We are able to distinguish a ripe apple for its color, a clear sky day for its color, a safe passage in a harbor by the color of its signalization and the distance separating us from an object from its dimension and the relative perspective. Other senses, however, compete for the comprehension of the world around us: the temperature, the odors, the sound and the taste. With the absent of sight, disabled people face difficulties in a world which, most of the times, disregards this need. How to know in which corner one is, in which building is a museum or a historical building located, are some examples of these difficulties. Although, much has been done, it seems to be our responsibility to investigate, discuss and propose solutions for the betterment of these people's lives. In the understanding that the design for all is the North for every designer, it is intended to participate in the effort of improving the daily lives of the blinds, regarding their inclusion and independent mobility. The focus of this research is established in the development of equipment's capable of situating disabled people in front of buildings with historical interest, with no intention of straining the subject, but only showing a small example of collaboration.

In this sense, this paper is proposed to the development of a directive/indicative signalization for the visually impaired, for the betterment of their independent mobility and to locate buildings with historical interest in the Center of the city of Porto Alegre, Brazil. For this matter, the paper is divided in four stages: theoretical foundation, meta-project, results of the meta-project and project.

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It starts with the analyzes of Strategic Design methodologies, joined to Universal and Emotional Design, so the product developed awakens better users sensations and experiences, regarding their independent mobility on urban ways. With this, it is presented a baseline research in order to understand which of the methodologies proposed by Strategic Design, including the methodology of projection by Munari (2008), which outlines the design as flexible, but organized. Afterwards, it analyzed the methodologies of Emotional Design, based on theories and on assessment scales dictated by Norman (2004) and Desmet (2002), indicating how to design and awaken sensations best and how to evaluate such sensations, Besides that, we present the Universal Design and its rules, the visually impaired, the street furniture and which is the relation of blinds with locomotion in urban ways, from case studies.

Furthermore, it is discussed the methodologies of Strategic Design, explaining all stages and it is raised the question: How to use the methodologies of Strategic, Emotional and Universal Designs and their project tools in the meta-project process of developing an object of street furniture, which covers all needs imposed by the lack of sight?

2 STRATEGIC DESIGN

The Strategic Design aims to increase the qualities of a project in order to get a better solution. It comprehends the relation of technology with social change, user-centric and a complete system in what regards the design methodology. The extent of Strategic Design allows organizing independently, build and rebuild the facets of a complex and fragmented disciplinary field (ZURLO, 2010).

The methodologies of Strategic Design can be compared to the ones of Celaschi and Deserti (2009), in Design and Innozazione, for the production of systems-products with some level of innovation. For the author, such methodology is separated into four phases: meta-project; meta-projection synthesis; concepts and analytical project; and detailed design.

In the meta-project is the contextual research of the company, its competitors and users, as well as the study analysis of similar cases. The meta-projection synthesis, in turn, is based on the synthesis of the data collected. With this, we make the cross-fertilization - which aims to foment the intuitive side of the designer - for the creation of the map and the SWOT matrix which indicate the strengths and weaknesses of the project. In addition to the building of model scenarios for projecting, such as visions, ideas and concepts generated.

At the stage of concepts and analytical design, each vision is transformed into a project with the pre-defined concept and such concepts go through a technical and feasibility evaluation.

Finally, there's the detailing of the project which elects the best concept and puts it into practice. Making strategic design go through all the steps of projecting, taking a holistic and multidisciplinary approach to achieve design solutions. Using all the aspects of the product, conditions of one of consumers and businesses needs, utilizing, afterwards, such requirements to influence the final solution of the project.

3 EMOTIONAL DESIGN

The perception of the world and of the objects changed from the concept of Emotional Design of Donald Norman who says "our house is full of products that do not work very well" and states that want products which add joy and pleasure in their usage (NORMAN, 2004). As a result, it indicates the existence of three levels of design: visceral, behavioral and reflective.

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Visceral design concerns the way it looks, feels and hears the world, "it is what nature does" (NORMAN, 2004). It seeks to awaken the pleasure and the initial and spontaneous reactions of the user. Yet, behavioral goes together with functionality and usage results, not electing appearance as an important matter, but its functionality. It is concerned with products that have a good performance and how to make this functionality easily accessible, so that the user only needs one time to learn how to use it.

The reflexive project finally focuses on the significance of the products, seeking a reflection on experiences lived, as it is the one with the highest value. According to MUNARI (2008), it is important to project according to the order dictated by the experience.

Experience and emotion occur according to three aspects; agent, events and objects. According to these aspects, DESMET (2002) propose a model to analyze the emotions of users with the products. The Desmet scale is given from numerous *giff*s, therefore, images with sounds and movements, which express different feelings. The user, after being introduced to a product, must select the *giff* which exactly translates the excitement and sensations awakened by the product. This allows a real visualization of the actual effect of the product on individuals. However, this experience has been thought usually to products for individuals on average, without those who have some difficulty are taken into account. Therefore, it is important to start thinking about products that generate experience and arouse emotions and at the same time, are accessible to all types of users , namely normal or holders of need.

4 UNIVERSAL DESIGN

The term Universal Design was coined by Ron Mace, a person with special needs, but the principles and definitions of such design emerged only a few years later, in the 90's. These definitions were created by Mace, with the help of professionals of the architecture field from the North Caroline State University and pursue projects which reach everyone, without the need for adaptations. Thereafter, the group has created the seven principles of Universal Design, which are: Equitable Use; Flexibility in Use; Simple and Intuitive Use; Perceptible Information; Tolerance For Error; Low Physical Effort; and Size and Space for Approach and Use.

One can understand Universal Design as "the feature set that somehow contributes to provide greater independence for people with disabilities, quality of life and social inclusion" (HOGETOP & SANTA-ROSA). It is the design that thinks about minorities and get more simple operation and general manageability (HERWIG, 2008). This kind of design, focused on the user, promote a new kind of projects, more sustainable, durable and valuable, because the "re-thinking" could be beneficial to the product and their users (STEINFELD & MAISEL, 2012).

5 THE VISUALLY IMPAIRED

Blindness is not a disease, but rather the consequence of an illness, an accident, or both, that might occur before birth, after, or in the first years of life; throughout life and due to sickness or injury. When acquired during pregnancy, the impaired has no memory of colors nor images and is classified as having congenital or early blindness and is bound to create concepts from methods that fit his/her needs. When acquired after the first seven years of age, the individual retains images and colors and utilize the memories from visual experiences and this way is able to create concepts. These, are classified as having acquired blindness (LOWENFELD, 1964).

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The visually impaired who suffers most, both physically and psychologically is the carrier of acquired deficiency, for it is necessary for him/her to adapt to the everyday actions of a totally visual world, having a lot of difficulties to an independent mobility in public environments due to non-designed and non-appropriate street furniture, which do not attend their needs.

6 STREET FURNITURE

The demands of progress, the complexity of urban reality, the emergence of new activities, the demand for new services and the different abilities of individuals, have caused changes in the metropolitan areas, which have turned into territories of maximum information and accessibility. But, for this, it is necessary to project the territory from its structural nature, giving it a real and lasting urban quality. Such culture of urban space is given by the true dimension of urban elements that are defined by their design, location and landscape formation.

Street Furniture defines the landscape and identifies the city, but for that, its project must contain three interrelated concepts: functionality, rationality and emotion (SERRA, 1996). The functionality is necessary because elements must be useful, serve all the needs that it proposes to supply, so the designer must feel the utility of the product, in order to avoid objects of dubious usefulness.

Rationality is required while technical reason and the materials are on top of affective experience to the comprehension of reality. Rationality is about technical skills and industrial manufacturing capacity.

Finally, emotion is needed so that the object causes psychological reactions and communicates feelings and experiences to the individual. It must achieve the integration between artistic value and the value of everyday use.

Therefore, urban elements should be designed seeking satisfaction in usage, feelings incitement, imagination and passions, as opposed to technical rationality and its usability.

But, to make a good project on suitable street furniture for the visually impaired, it is important to study what already exists today. Thus, some cases like the Tiflológico Museum from Once (a museum adapted for the visually impaired), in the city of São Paulo, its traffic lights with sounds and accessibility laws; and the city of Curitiba through its Garden of Sensations, with its model of accessibility in public transportation and public sidewalks with tactile floors were analyzed.

7 STRATEGIC DESIGN METHODOLOGY APPLIED TO THE PROJECT OF STREET FURNITURE FOR THE BLIND

The methodology was chosen from tools included in the strategic design, which together allow the total comprehension about the project. This methodology has steps like action research, briefing, contextual search and mapping, research with target audience, analyse of user's needs, brainstorming, moodboard, scenarios and personas and a final concept.

7.1 ACTION RESEARCH

The action research is a generic term for a lot of activities intended to change things (LEWIN, 1946). For Tripp (2005), it's the "identification of strategies of planned action which are implemented and, then, systematically submitted to observation, reflection and change", using forms of research to improve the

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practicing an action. This type of action research requires actions both in the areas of practice and in research, changing what is being researched, but it is limited by the context and practice. Action research always starts from some sort of problem and often the term 'problematize' is used (TRIPP, 2005). Thus, this work can be understood as an action research since it combines several fields, and searches strategies for implementing better solutions on "problematization" and innovation.

7.2 BRIEFING

The briefing can be one of the intentions of those who are ordering the creation. It is up to the designer to produce satisfactory interpretations to trace a previous planning of the project, during the conception of the process.

The briefing "project of products of street furniture suitable to the necessities of the visually impaired" was created from studies which point to the need for adaptation and creation of street furniture, for what already exists, instead of facilitating the lives of the disabled it makes more difficult for their mobility on public ways.

7.3 CONTEXTUAL SEARCH AND MAPPING

Contextual search is based on the ethnographic research method that consists in observing individuals and environments interacting and performing tasks in their natural environment, which allows monitoring the cycle and the composition of each person. This analysis can be complemented with interviews that could raise additional perceptions relating to their difficulties facing urban centers.

Places of historical importance in the city of Porto Alegre were mapped, all of them located in the Center neighborhood. It is considered one of the oldest neighborhoods in the city, since the city began its settlement in the vicinity of its first chapel, located at Marechal Deodoro da Fonseca Square, known as Matriz Square.

7.4 RESEARCH WITH TARGET AUDIENCE

To research the target audience, it is observed the user in his/her routine, so fifteen users are accompanied for a few days at strategic moments of real interaction with the environment and street furniture, thus discovering what is being assisted, what needs improving and also to discover new possibilities.

Besides raising user requirements and evaluating mobility difficulties, a conversation with users was performed from a semi-structured questionnaire, thus, the real needs and difficulties of independent mobility from the impaired people were pointed.

With the analysis of users, ten of the major, and most mentioned, difficulties of independent mobility were elected, as follows;

  - Public telephones (payphones);
  - Cars improperly parked on public ways (sidewalks);
  - Bumpy public ways and manhole without covers;
  - Traffic lights exclusively visual;
  - Private businesses which use public ways as an extension of their space;
  - Steps and stairs not signaled on public walkways;
  - Lack of signage to major establishments as banks, notary offices, post offices, and police stations;
  - Lack of signage on pedestrian crossings;
  - Lack of signage for streets and avenues;
  - Lack of proper signage indicating stops for public transportation;

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From these numerous difficulties found in patients with a visual impairment it is possible to map and point out the actual necessary changes that must be applied in street furniture in the center district of Porto Alegre. Facing these barriers, it is possible to create a reference frame focused on the subject that guides and translates the concept of the project; street furniture suited to the needs of the visually impaired.

7.5 BRAINSTORMING

Brainstorming is based on a methodology of exploration of ideas, in order to obtain better solutions. From it, one can reach ideas of quality, or get to the solution of a situation or problem. In addition, it has the advantage of having distribution of merit. It is the result of the work of a whole team.

A collective brainstorming session was held, with some members with visual impairment, whose thoughtful words had coherent meanings with the themes and methodologies discussed in Strategic, Emotional and Universal Designs, as well as terms that were related to the visually impaired and street furniture.

7.6 MOODBOARD

Moodboard is a typical poster of design used as a search of stimulus, inspirations and creativity through images which specify what was wanted. The drawing design comprehends not iconic or symbolic signs or iconic and similar signs. Symbolic signs occur to the reader as a conventional representation, they stem from the arbitrary. The iconic signs have an analog relationship with what they represent; they are not arbitraries (BOUDON, 1998).

For this reason, figures related to the theme were elected, as images of guide-dogs, objects with buttons in Braille, different textures, cinema icons who are recognized worldwide for the representation of the visually impaired as Al Pacino in Scent of a Woman and the music icon Stevie Wonder, singer, songwriter and American humanitarian and social causes activist, blind since his birth, among other icons. Its purpose is to represent, quickly and easily, the objective of the project which is the creation of new products for the visually impaired. From it and the words elected in the Brainstorm, one can build scenarios in which the project can be inserted.

7.7 SCENARIOS AND PERSONAS

The construction of scenery is a tool which allows you to pass from one stage of information analysis to a phase of pre-project proposition trajectories (CAUTELA, 2007).

The scenarios can be valid tools to guide projection of a new product and to assist the development of launching strategies. In order to reach satisfactory results of scenarios, one should choose four - or more - polarities and from these, start personas and possible design solutions. Personas not only make the target audience more realistic for designers but also guarantee the priority of requirements to specifically meet the needs of the most valuable users (CAUTELA, 2007).

The creation of scenarios occurred from the appearance of four polarities; universal and restricted, independent and dependent. From these, four scenarios have emerged - internal and external, private and public - which served as new polarities to create new four scenarios, focused on project proposal, as street,

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club, train, house of which only one was selected, the street scenery. The selected scenario understands public urban environments, where numerous individuals transit daily, the most pedestrian.
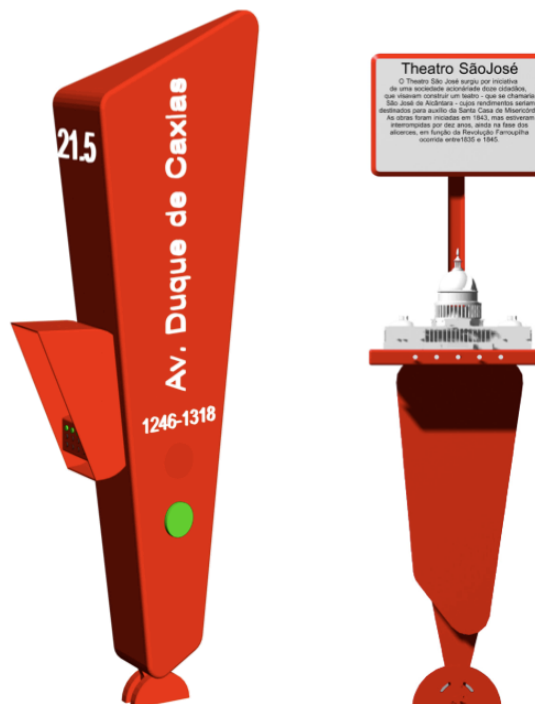
7.8 CONCEPT

The idea of meta-project phase, according to Moraes (2010), inserts itself into a space excessively dynamic and constantly changing, which characterizes both the complexity of the act of designing as the complexity of contemporary society. This paper discusses strategies for building concepts involved in the early stages of design. The issue launched must be explored in order to characterize the key concepts and unite them, along the information and knowledge acquired in the meta-project phase, thereby creating a Concept.

Thus, we selected two difficulties mentioned and is created the concept, to describe the daily life of the visually impaired, regarding the inclusion and independent mobility with the development of an indicative/directive signaling, capable of locating the disabled person in front of buildings of historical interest.

For the project to be consistent with existing campaign in Porto Alegre as *"Curta o Centro a Pé"* (Enjoy the city centre on foot), the option is the use of an exclamation mark (!) for the shape as an apology for the "pins". The exclamation point would indicate that at that place there is a touristic spot, a center of information, a historical local. Thereby, it is defined the shape of the totem for the corners and the element that is located in front of the historical buildings.

The first, also used as a light source - lights in its interior - has the triangular shape and is located on the corners. It carries the ordinary information as the ones on corner signs as street names, block numbering, neighborhood, along with the same information, in Braille, in addition to a brief location of historical sites nearby. It becomes an object of universal use, serving as aid for carriers, or not, of visual impairment.

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Figure 1 –Street totem and totem to historical buildings.

As for the second signal, whose form will be conceived from the first, located in front of the historical buildings and has historical, cultural and architectural information of the building in Braille, in addition to having a button which, when pressed, narrates the information. It also has the shape of the building, in high relief, so that the visually impaired - and other individuals - can feel the building and, somehow, see it. Its height is reduce, so it reaches people with physical disabilities, such as wheelchair users, and individuals of different sizes and its legibility will be thought not to exclude individuals of different visual, motor and psychic abilities.

7.9 EVALUATION PHASE

After the development of two totems, models have been prepared in 1:20 scale, so they could be validated with previously addressed users. The users could feel it's forms, it's reliefs and features. This step enabled a design feature analysis, since all users believed that the final solution would be functional and their goals were achieved.

8 FINAL CONSIDERATIONS

At the end of this project it is believed to have reached the goals initially proposed, since it assists the independent mobility of the visually impaired, in the Center district, of Porto Alegre, and it makes the disabled person see the city and its buildings as other users do.

According to Cambiaghi (2007), for the application of Universal Design, some items must be observed and achieved as: accessibility, circulation, usage, orientation, safety and functionality.

The project affects the item accessibility, as it assists the location and consequently, accessibility. The union of movement to the orientation reinforces informative/directive of the project, which assists the disabled person, and the not disabled, in street location and in the history discovery of important establishments in the district. The utilization fits not only by the totem on the corner, which gives directions and location, but, mainly by the totem located in front of buildings, because it makes possible to the disabled people to use, learn and see, as other users do. Howsoever, security is achieved, as it helps the disabled in the act of crossing the street, by audible signal.

It is believed that the project has functionality as it is directed not only to one type of user, but all of them. It affects not only the disabled, as the common user, assisting in their independent mobility, besides assisting in the dissemination of the history of the district, thereby generating more interest for it. This interest that could be little, by the visually impaired, as they could not see what had been said and, with the project, it is possible that they have identical experiences, if not more sensitive, than others, through touching the replicas and by audio description.

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