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Proposition of a supporting method for the generation of ergonomic specifications

David Omar Núñez Diban^{a,*}, Leila Amaral Gontijo^b

^aState University of Santa Catarina, Av. Madre Benvenuta 1907, Florianópolis 88035-000, Brasil

^bFederal University of Santa Catarina, Trindade, Florianópolis, Brasil

Abstract

This research proposes the initial form of a method for industrial design development process. The main goal of this method is to help industrial design student to construct product design requirements considering ergonomic information. The proposed method focused on aspects involving interaction behavior process between human and product. Aspects like body movement, contact and abilities are considered inside the method. The method aims to investigate important information of the relationships between user and product, from two ways of comprehension and analysis. The first point of view considers the user and its way he manipulates and interacts with the product. And, the other is about what the product is demanding from human capabilities and what advantages are offered to the user. The proposal applied a pilot test to improve its possibilities of use and effectiveness comprehension by the students. The methodology applied used two questionnaires. The first questionnaire researches the way the student defines his criteria to select the information to build the requirements of conceptual product. The second questionnaire applied at the end of the process evaluates the scope of the method. In the middle of both questionnaires was exposed the methodology, was observed the product development process made by students, and applied the method. Final, analyzed the results of the method, and compared the results of the questionnaires, was identified some benefits on clearance the objective of the ergonomic information, needed to define the product conceptual requirements. The method provides detailed information allowing the student to identify ergonomic aspects that weren't considered in previous analyzes. These make corrections to the requirements of the project.

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* Corresponding author. Tel.: +55-48-30286277.

E-mail address: omar.diban@gmail.com

1. Introduction

Throughout this research has been made analyses of various methodologies, product design development frameworks, in which studies discuss the various ways in design development and implementation of certain techniques, tools or methods.

The application of a specific method follows the particularities of each development process or specificity that will be done for the project approach. This particular situation does not confine the applied methods to a single or particular and unique stage of the project. This means that if you select a method, for example the Brainstorming in the creative process of the Product Development Process - PDP, doesn't define it to be used always in this stage of the project. This exploratory method, Brainstorming, can be used in advanced stages of the PDP, as the conceptual, depending on the specific situation of the project, where there is the need to explore new ideas without a strict compromise.

This research proposes a method (from Latin *methodus*), because it is a process to reach knowledge. In this case, the one linked to the product ergonomic specifications. Thus, the method, aims its application according to demand and not according to a specific stage of the PDP. Otherwise, its origins belong to the early stages of the PDP. However, confine its use to these phases, limit its use and deployment to other parts of the PDP, limiting its benefits on exploring unusual products designs.

2. An idea for a method

The present research propose a tool that works with ergonomic characteristics, important not only for its incorporation at the beginning of the PDP, but also for its extensive comprehension whet reaches subjective information levels, which become necessary for the exploration of new product-user interaction.

The primary focus of this proposal is on academic training of new professionals in Industrial design (college students). Therefore, it has been defined as a premise a way of working with low complexity, expending less time and using a language within the universe of the students. Then, the final data, generated by the use of the method, will be in an objective and pragmatic language, enabling its materialization and measurement as design requirements.

The information to be worked on it, as anthropometric parameters, are not considered directly, by its extensive knowledge and application in the PDP. But the results obtained by the method may request these anthropometric data.

Another aspect is to avoid an ergonomic analysis restricted as a corrective proposition to the problems occurred when the product is in use, weakness of the product or by comparison with other a similar product. Therefore, the analysis of the product defects will consider improper use, improper interface or misunderstanding of the product functions. The absence of such understanding was detected when analyzed a group of Industrial Design students, in his first experience of design development. In this situation, it is important to know the interaction between the user and product, for a higher comprehension of future function of the product to be developed. Therefore, the target of the proposed method, from now named *MÉSSEER*¹, is not restricted to existing data of postural approaches or dimensional analysis of the human body in work situations, widely documented in the anthropometric references. The main goal of *MÉSSEER* is the comprehension of the product, understanding the product use-end and the interactions that take place in it, providing ergonomic context data for the construction of the project requirements. But, these may generate subjective content of information. So, the *MÉSSEER* works to reduce the ambiguity of these subjective parameters. And generate information that can be manipulated within the scope of project development.

¹ *MÉSSEER* = from Portuguese Método de Suporte à Geração de Especificações Ergonomicas, that means supporting method for the generation of ergonomic specifications

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