

Device to aid the transport of children in different modes of transportation

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1 Context

Rarely we go somewhere just on foot, nowadays we have numerous kinds of transportation vehicles that were made to carry us with comfort and safety. But, how do we deal with the transport of children? Through an extensive research, using methods of design development, the highlight was the need of a product that can assist adults to transport children regardless of the way of transportation. A product was developed binding two features: a stroller and a child safety seat, which can be installed in any vehicle, such as taxi, bus, train, airplane and any other means of transport.

The Design of Transport proposes to develop products and systems for mobility, not only creating products for efficient transport, but also for the best possible experience for the user. However in many cases the projects do not include the needs and desires of all users, especially when children are concerned. Nowadays the mobility requires artifacts that assist persons in commuting from one place to another, and often, some users end up being disadvantaged by not being part of the majority. The children are part of that group that requires products for their displacement.

Thus, keeping in view the current needs of transportation and their importance for the development of individuals, and considering the gains to be obtained by the interaction of children with social context, this work proposes to develop an artifact for aid the transport of children in different modes. This artifact should have functionality designed to the needs and desires of all individuals involved, whether they are parents, children, grandparents, or anyone who interacts directly or indirectly with the product, and simultaneously to encourage individuals safely to new experiences to assist in developing motor, social and cognitive development.

2 Method

For theoretical research aimed to deepen the knowledge about human development in the first years of life as well as their physical and cognitive abilities. To support methodologically this study, was sought references in integrated product design methodologies, Back et al. (2008), as well as auxiliary methodologies Baxter (2000), Brown (2010) and Platcheck (2005). Back et al. (2008), product development include aspects of planning and design, along the stages through which the product, from the planning, market research, product design, process design manufacturing, use, disposal, etc.

Was consider two types of users, children and adults, the secondary users. In order to determine the scope of the children target audience, was used a relationship between weight, age and height. These data were used in accordance with World Health Organization (2006), data from Ministério da Saúde (2007), data from ABNT NBR 14400:2009, and data from the book Measure Of Man And Woman (TILLEY, 2005). Therefore, the artifact being developed covers children six months, weighing not less than 9 kilograms and height greater than or equal to 70 centimeters to four year olds, weighing less than 18 kilograms and smaller than 102 centimeters.

To elicit the user needs unsystematic observations were made (MORAES and MONT'ALVÃO, 2009), task analysis (BAXTER, 2000) and empathy (Brown, 2010). By Mudge diagram (BACK et al., 2008) an evaluation was made of the degree of importance of the attributes that translate user requirements previously determined. For the comparative evaluation of existing products in the market was used the methodology applied to the development of sustainable products from Platcheck (2005). The objective of this phase is to prepare the ground work for the later stage, the detailing alternatives and manufacture stage.

After the identification of project requirements, we started the product concept. To create the style of product were used various methods such as mood boards, mind maps, personas, storyboards and visual references. The process of generating alternative was divided into two stages: generation by the method of analogies and free generation focused on each component of the product. In the second phase, the alternatives were grouped from the previous step to create new alternatives broader and considering the product as a whole. After defining the alternative, developed the virtual model for greater detail of the product components and their functionality. This process was accompanied by generation of prototypes to validate the actual size of the product volumes.

3 Results

The product aims to help transport children to fill the necessities for products made exclusively for the transportation of children. This product improves the quality of life

of children and mainly leverages its development safely. Is a versatile product with multifunctionality, functioning both as a stroller as child safety chair for different kinds of transport vehicles. The product were tested and analyzed constantly in the ergonomics design geared to users. Regarding the height of the stroller, the extender has 14 levels in height and can adjust the size of the stroller for any height user. In addition, the seat is attached to the extender, so regardless of the size of the chair user will always be at a comfortable height for removal and placement of the child, as well as more interaction between users.

Most public transport vehicles such as trains and buses do not have seat belts on their seats for passengers. Therefore, the product comprises a waist belt that surrounds the backrest and the seat fixed with the vehicle seat. Thus, the child is safe even in transport that is not offered any type of seat belt. For vehicles that have seats with seat belt must pass the belt between the handles at the base of the child seat, and the transverse part above the seat, between the handle bars and seat. Thus, the product structure simulates a human body making the vehicle's seat belt for child protection. Regarding the use of seat in cab, its attachment keeps the same as used for fixation in conventional vehicles with seat belts. In the example of the airplane, both the waist belt and the lap belt's own airplane seat can be used.

4 Conclusions

Throughout the development of this work could be seen existing deficiency in transporting children, and at the same time, can be seen how important is the focus on the user interaction to design the product, especially for children. The project aims, in addition to designing a concrete device to transport children in different ways, presenting the problem, and make aware of the risk that the lack of products to this target may cause.

It was also necessary discuss the topic of a target audience that does not express verbally their needs. During a similar analysis could be seen that the products on the market are intended for adults, with less concern for the comfort and well-being of children.

Currently we see a growing movement in defense of children's safety. Still, there is no product on the market designed to transport children in buses, trains and taxis, making transportation of children in these vehicles an extremely dangerous thing. The featured product is more than a project, a warning to other designers and users about the importance of products that fit to safety and comfort of children.

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