

Evaluation of users expectations about perfume bottles: Kansei Engineering Approach

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1 Context

This paper presents a practical study of Kansei Engineering in the evaluation of masculine perfume bottles, exemplifying how the method of Kansei Engineering (KE) can assist designers on developing projects each time more centred on the user. KE, which might also be called as Emotional or Affective Engineering, is a method for product development that enables the designer to translate impressions, feelings, and user expectations into solutions and concrete project requirements (SCHÜTTE, 2002). This study aimed that, by using KE, the subjective information about users can be objectively interpreted in a way to facilitate the decision making process on the product development.

Several designers and researchers, always inserting new technologies on the project, such as virtual reality, have used this methodology, such as Nagamachi (2011) and Schütte & Eklund, (2003). The method was first developed on Japan, in the 70's, and since then has originated six different types of Kansei Engineering: Category classification; Kansei Engineering System (KES); Hybrid; Mathematical; Virtual; and Collaborative. The main goal of KE is the more objective comprehension of a specific group of users, adapting itself to the usage of new technologies to assist the product development, always focusing on the user experience as a whole.

2 Method

This research applied the KE type 1, kansei evaluation, and the KE type 4, mathematical. The data was collected by the following main steps: 1) definition of the research scope; 2) gathering the source kansei words; 3) refining adjectives by user

evaluations; 4) kansei evaluation. KE type 1 was used in the first moment of the research for enabling the identification of kansei words from users, and, therefore, can be used as a basis for developing the following types of KE. Then, by applying the KE type 4, the collected data were systematized on a questionnaire of semantic differential, which resulted data was evaluated by using linear regression. Overall, this method was adapted from Barnes et. al. (2008), whose presented the Kansei Toolkit for Packing Design.

The research required products that were of easy access to perform tests with users, whose should have the evaluated products available during the research. For that, perfume bottles were selected, since these products present a large variety on the market, which allows using different products for the research. The perfume bottles used on the research were selected accordingly to their availability between researchers. Overall, twenty perfume bottles addressed to male consumers were used on the research.

After selecting the products, several adjectives, or qualities, were collected from marketing materials of the perfume bottles manufacturers. In each advertising description, some specific words are used to present potential users and attract the target audience. In this kind of material, adjectives not only describe the product, but also offers qualities that the target user searches on the product. Those advertising materials were collected mainly by the manufacturer's websites.

The following step was the process of semantic expansion (Barnes et. Al., 2008), in which is performed a search of synonyms for the words. This step aimed selecting representative words for male perfume bottles. At the ending of this step, the adjectives were reduced from 573 to 54 words. Then, the adjectives went through a refining by four linguistic filters, proposed by Barnes et. al. (2008).

After verifying that the filters application was not enough to reduce the adjectives to a viable number to be analysed, it was performed a factor analysis to eliminate words with similar meanings. With this analysis, it was possible to reduce to a total of ten adjectives, they were: arrojado (dashing); delicado (delicate); diferente (different); fuerte (strong); innovador (innovative); leve (light); original; resistente (resistant); robusto (bold); vanguardista (avant-garde). By analysing these adjectives, it is possible to notice that some words are very contrasting between each other, such as light and bold. So, it was decided to attribute weights to each adjective, taking into consideration the main target audience as an urban man, from 20 to 30 years old. Those weights were defined by a debate dynamic. Regarding to the applicability of each adjective, their purpose on the product was identified by decomposing main design characteristics of the male perfume bottle: shape, colour and material, and finishing.

The kansei evaluation was performed using the adjectives (source kansei words) as a basis for a semantic differential map, answered by four users of the target audience, all designers or design students. In order to construct this map, the adjectives were

presented to the volunteer users, with images that supplement the meaning of the words, in order to standardize their meaning. Then, the 20 selected perfume bottles were available to the users to handle and analyse them. However, users were not allowed to smell the perfumes, since the evaluation addressed only the visual and tactile senses.

Then, users were asked to organize the images of the perfume bottles on a line, between the pair of presented adjectives, in an intuitive way. The line did not present any kind of scale or gradation, to not affect user's perceptions. All mappings were registered by pictures and, then, transposing them into a scale. This scale was divided into 10 points. For each positioning, each perfume bottle received a value from 1 to 10. With the average each bottle to each adjective it was possible to visualize which product was more differentiated from the others.

At the ending of the kansei evaluation, kansei words from the target audience were identified, as well as perfume bottles that represent better each word. The kansei words were: diferente (different); forte (strong); robusto (bold); and resistente (resistant). However, just reaching to kansei words was just a step: it was necessary to evaluate the user perception on the perfume bottles. For that, it was applied a semantic differential questionnaire. For that, a seven point scale was used, in which each kansei word was presented on the positive side, and their antonyms on the negative side. Each perfume bottle was evaluated by a questionnaire. Twenty one users participated of this step answering the questionnaire.

3 Results

The data resulted from the semantic differential questionnaire were analysed by a Multiple linear regression. The data presented an acceptable value of R-Square, however, did not reach the expected value (>0.9). One of the reasons for this result was the small sample, verifying that for reaching consistent values, an ideal sample would be at least 50 users.

This study allowed the researchers to verify that the number of variables does not have to be as reduced as it was to reach consistent results, so some steps of filtering are not necessary for future studies. If the ten adjectives were applied on the multiple regression analysis, it is likely that would be possible to locate which words influenced positively and negatively on the study, by predictions of elements on the regression calculus. On the other hand, between the variables used on the study, the words Different and Resisted were highlighted from the others, evidencing that they are probably adequate for using in future developments on male perfume bottles development.

4 Conclusions

With this research, it is expected a better and broader understanding of the user's feelings regarding perfume bottles. The linear regression evidence those user's feelings, by identifying which independent variables are related to the dependent variable. The study presented positive results, when considering its main purpose, which was the methodology study, verifying errors for future uses on products developments.

A proper detection of kansei words, their accurate interpretation and their association with elements of product design are key aspects not only in the creative process, but also mainly for narrowing the gap between the work of the designer and user perception. This way, the designer can make design decisions that do not rely in its own subjective interpretation, but based on a specific understanding of user expectations.

5 References

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