CORRELATION BETWEEN CUSTOMER'S PROFILE AND PRODUCT'S AESTHETIC FEATURES

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În articolul de față, autorul descrie un experiment efectuat pentru a verifica dacă există o corespondență între profilul clientului şi caracteristicile estetice ale produsului. Două scrumiere concepute de renumiți designeri italieni au fost arătate subiecților experimenteului, care au fost rugați să-şi imagineze profilul clientului care ar cumpăra respectivele produse. La baza procesului imaginativ a fost design-ul produsului. Rezultatele au indicat faptul că există o corelație, design-ul semnificativ este mai relevant, iar forma este mai importantă decât culoarea.

In the present paper, the author describes an experiment carried-out for the verification of the correlation between customer's profile and product's aesthetic features. Two ashtrays designed by renowned Italian designers were shown to subjects who were asked to imagine the customer's profile who would buy those products. The product aesthetics was the basis of imaginative process. The results indicated that the correlation exists, the significant design is more relevant and the shape is more important than colour.

Keywords: industrial design, product aesthetics, customer's profile, demographic segmentation

1. Introduction

Regardless of author, every methodology for designing products starts with the market research stage. A successful product always meets the needs and expectations of the customer. In order to fully understand and deepen the knowledge regarding the customer's needs and expectations, the design team should carry out an extensive market research.

Stuart Pugh, in his seminal textbook *Total Design*, indicates as the first stage of his methodology the study of "market / user needs and demands" [1]. It should be noticed that Pugh emphasises the strong relationship between market and user. Actually, the product's market is the total group of users.

Karl Ulrich and Steven Eppinger, authors of the well-known textbook *Product Design and Development*, put at the base of the design process "identification customer needs" [2]. In this way, the design team is sure that they target the real needs of the customer.

But one aspect of the product is its industrial design, respectively the product's aesthetic features. The design of product's aesthetic features is done

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within the general framework of product design and synchronous with the design of functional features. The design of product's aesthetic features is not a process developed separately from product design process and surely is not an afterwards beautification of the product.

Considering this, it is obvious that the conception of product's aesthetic features is done following the same methodology as the design of the whole product. And the conception should begin with the market research.

Jon Kolko, Associate Creative Director at the famous design company *frogdesign* and the Founder and Director of Austin Centre for Design, presents in his lectures some classic market research methods tailored for industrial design. Among them, there are presented and analysed: questionnaires, surveys and focus groups. [3]

In the world of industrial design, the professionals gradually acknowledge the importance of the context design, respectively that design concerned not only with the product as an distinct entity, but as existing in a context composed by user, market, society, etc. In this regard, an important contribution to the theory of contextual design is the textbook *Rapid Contextual Design: a How-to Guide to Key Techniques for User-Centered Design*, written by Karen Holtzblatt, Jessamyn Burns Wendell and Shelley Wood [4].

So, the conception of product's aesthetic features should start with the market research. It is well-known that one product, regardless it's complexity, cannot meet the functional and aesthetic requirements of all customers. For example, the elder people have a weaker grip, diminished perceptual capacity and an undependable memory. Different products should be designed for them. The branch of design dedicated to elder people is called *silver design*.

Taking into account only the aesthetic requirements, the most obvious example of different demands is that of young generation. Young people insist on buying products with a definite different look comparing with their parents' products. Another example is the case of the first generation of chargers for cordless household products. Their appearance was very technical. For this reason, they were not successful commercial products, because the buyers were women and women disliked the neutral-technical shape and colours of chargers. Later, after the chargers' shape was redesigned and became slimmer and curved, the chargers turned into successful products. [5]

The conclusion is that there is no generic customer. The companies must segment their market in order to target the right segment for carrying out the research and development. Obviously, this is not a discovery, but a common-sense approach, well-known by companies and researchers.

Almost all companies claim that they target a specific market segment with a specific product or a specific range of products. The targeting process

covers all products' aspects: functional, ergonomic and aesthetic. Is this true? Is this accomplished?

Let's consider the process of market segmentation. The segmentation is done according to the customer's demographic profile, constituted from a set of criteria. In some industries, it is not necessary to segment the market according to a large set of criteria, but in other industries this is essential. The following set of criteria can be considered as a customer's demographic profile at a certain level of complexity:

- gender;
- age;
- level of education;
- field of activity;
- position within organisation;
- income;
- family size;
- type of residence;
- cultural level;
- lifestyle;
- political orientation.

Are the companies using this criteria, or at least part of them, to segment their market? This is difficult to find out. But considering that this is true, the efficiency of the process can be measured. At the aesthetic level, the industrial design of a product should indicate the targeted customer's profile.

2. Design of experiment

The aim of the experiment was to determine if a correlation between the product's aesthetic features and the customer's profile (as a set of demographic data) exists.

The technique used in the experiment was the projective technique. This technique is based on the associations that people establish between products and certain significances. At the core of this technique stands an indirect approach. People are not asked directly about their opinion regarding a certain issue, but asked to think what will be the opinion of a given person (presented briefly in a so-called scenario). In the case of this experiment, the subjects were asked to imagine the customer's profile of a product presented in a photo.

Fig. 1. Achille Castiglioni – *Spiral Ashtray*

Fig. 2. Bruno Munari – *Cubo Ashtray*

It was decided to use only two products in this experiment, in order to avoid the boredom of subjects. Today's products are well-known to subjects and it was obviously that subjects' assessment will be biased by advertising and other conjunctural events. So, it was decided to use older products with a remarkable industrial design. Also, the products should be of household type with a low level of technical content.

Actually, the ashtray type was selected. From a set of dozens of ashtrays, two were chosen from the golden age of Italian design. The first chosen product was the *Spiral Ashtray* designed in 1970 by Achille Castiglioni (Fig. 1). This ashtray is entirely made from metallic materials. The second was the *Cubo Ashtray* designed in 1957 by Bruno Munari (Fig. 2). This one is made from plastic (the case) and metal (cigarette support). Both ashtrays are characterised by simple, but significant, geometric shapes.

The customer's demographic profile used in the experiment was the one presented above in introduction. Each criterion was associated with a list of variables, as presented in Table 1.

Table 1

Customer's demographic profile

Criterion	*Value 1*	*Value 2*	*Value 3*	*Value 4*	*Value 5*
Gender	Male	Female	-	-	-
Age	Adolescent	Young	Mature	Old	-
Level of education	Primary school	Secondary school	High school	University	-
Field of activity	Agriculture	Industry	Commerce / Transport	Finance / Banking	Services

Criterion	*Value 1*	*Value 2*	*Value 3*	*Value 4*	*Value 5*
Position within organisation	Clerical	Junior leadership	Senior leadership	-	-
Income	Low	Average	High	-	-
Family size	Single	Couple, no children	Couple with 1-2 children	Couple with >2 children	Extended family
Type of residence	House with no garden	House with garden	Flat in villa	Flat in block	Luxurious flat
Cultural level	Illiterate	Minimum knowledge	Average knowledge	Connoisseur	-
Lifestyle	Conserva-tive	Family person	Socially active	Hedonist	-
Political orientation	Left wing	Centre	Right wing	Extremist	-

The next phase of experiment design was the establishment of experimental methodology. The experimental methodology consisted in the following steps:

1. Each subject examines carefully the product (presented as an imagine on a computer screen).
2. Based on product's aesthetic features, the subject imagines the profile of the customer who would buy that product.
3. Each subject ticks on his / her worksheet the variables of customer's profile he / she considers as appropriate.
4. Each subject selects the product's aesthetic features that influenced most strongly his / her assessment.

Note: Each criterion had an additional value for undecided subjects: "Don't know".

3. Results of experiment

The experiment was performed using 293 subjects. All subjects were young (22-24 years old). The gender distribution of the sample was: 161 female and 132 male. All experiment sessions were supervised by the author of the present paper.

The raw results were recorded in a computer spreadsheet – one worksheet for each product. Actually, each criterion had a column in the spreadsheet and the choice of subject was recorded as a number. (Value "Don't know" had always

assigned number #0, value 1 had assigned number #1, value 2 - #2, etc. – see Table 1).

The spreadsheet counted how many times each value of customer's profile was ticked. Also, the spreadsheet calculated the Cronbach alpha coefficient for each product.

The Cronbach alpha is a statistic indicator used in the assessment of psychometric tests. If its value is higher than 0.7, the meaning is double: a) the test was well designed; b) the subjects answered correctly and no misunderstandings or ill-will occurred.

The formula used for the Cronbach alpha coefficient was:

$$\alpha = \frac{N}{N-1}\left(\frac{\sigma_X^2 - \sum \sigma_{Yi}^2}{\sigma_X^2}\right) \quad (1)$$

where N is the number of items (criteria in this case);

σ^2_x – variation of sums for each item;

σ^2_y – variation for each item *i.*

It was decided not to use the average indicator, because it can mislead the results, considering that the values of each criterion are discrete separate categories. For example, if the criterion *Field of Activity* for one of the two ashtrays will have an average of 2.5, what will be the meaning? That the customer works either in "Industry" or in "Commerce / Transport"? But the average of 2.5 can be obtained from a lot of choices of "Agriculture" and, respectively, "Finance / Banking"! So, the average indicator was not used.

The experiment results of statistical calculations for both products are displayed in Figures 3 – 13. The results are presented as histograms measured in percentages. The histograms were considered as more illustrative than any other representation.

A first observation is that the first ashtray allowed a better assessment from the subjects due its remarkable visual qualities. At all criteria, the first ashtray had better scores than the second at the "Don't know" value. The first ashtray had always lower values, sometimes even 0. At almost all criteria, the highest value was achieved by the first ashtray. (This can be noticed looking at the highest column in all the figures.)

Another important observation is that the criteria *Political Orientation*, more than half of the subjects were undecided (54.5% ticked "Don't know"). There are two possible explanations for this. The most direct one is that *Political Orientation* is not a reliable criterion for market segmentation. The second one is based on the weak political culture in Romania. Subjects didn't make choice because probably they did not understand the meaning of values.

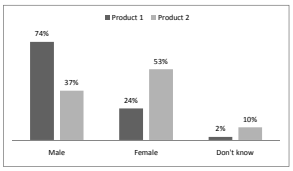

Fig. 3. The presumed gender of products' customer

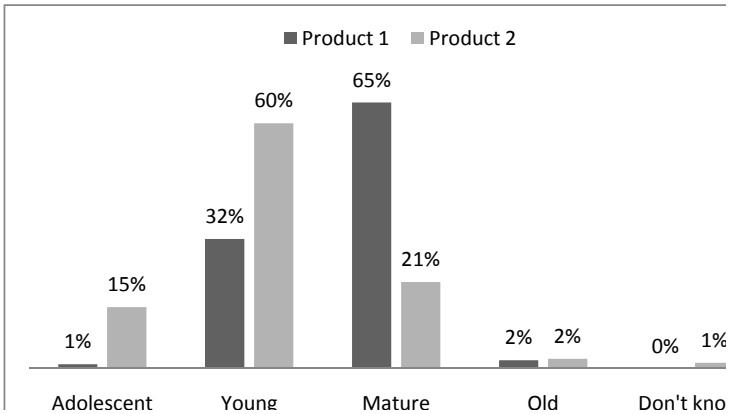

Fig. 4. The presumed age of products' customer

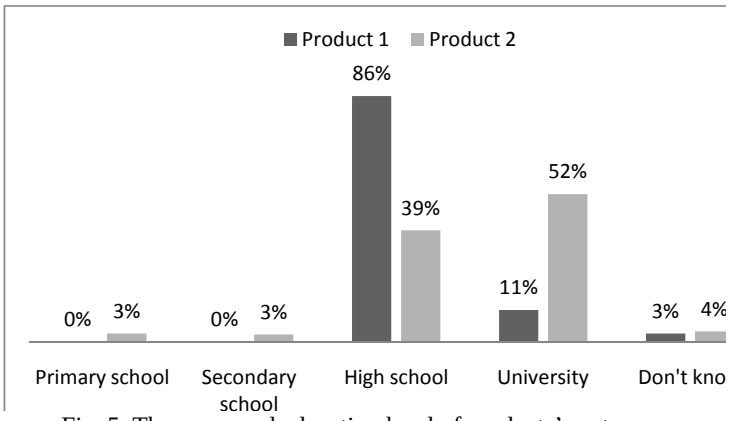

Fig. 5. The presumed education level of products' customer

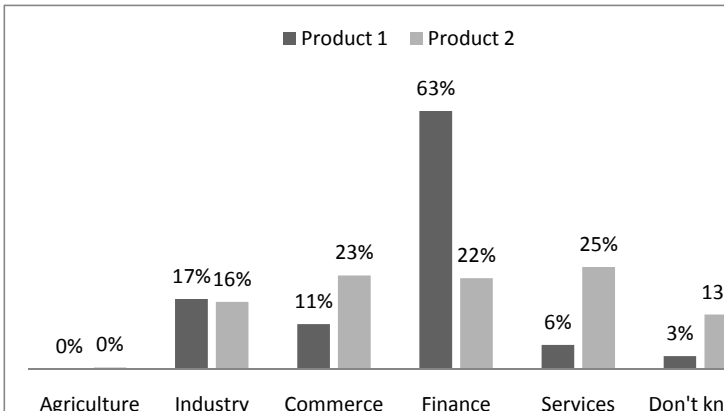

Fig. 6. The presumed field of activity of products' customer

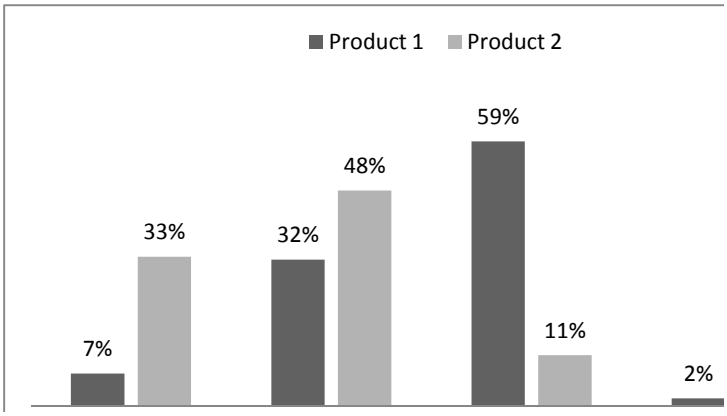

Fig. 7. The presumed work position of products' customer

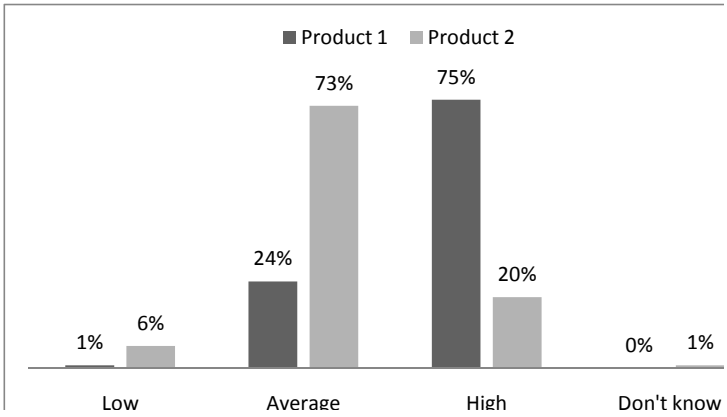

Fig. 8. The presumed income of products' customer

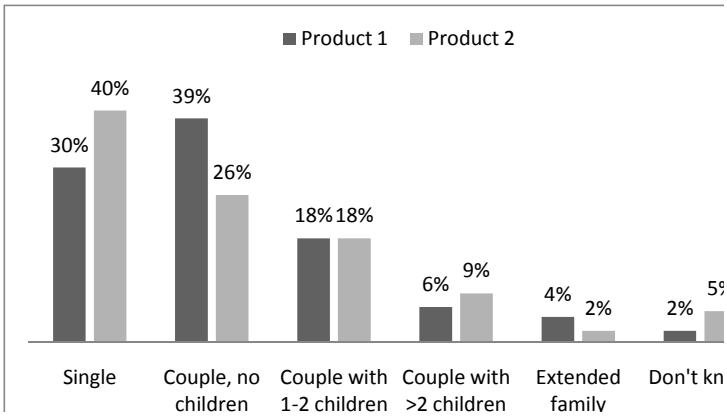

Fig. 9. The presumed family size of products' customer

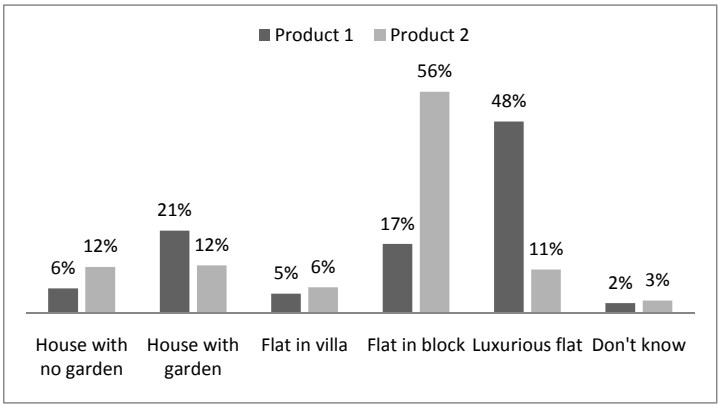

Fig. 10. The presumed type of residence of products' customer

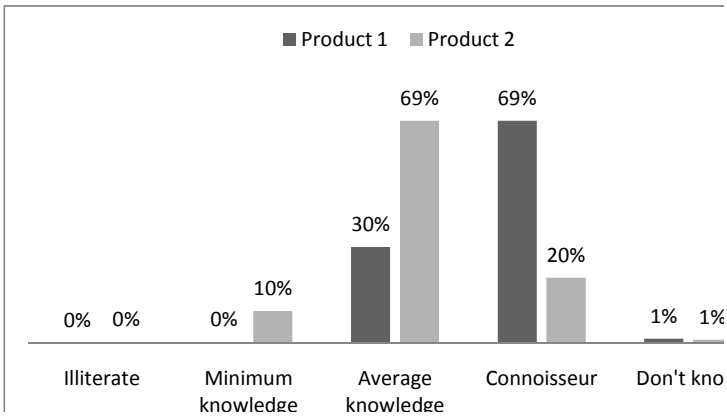

Fig. 11. The presumed cultural level of products' customer

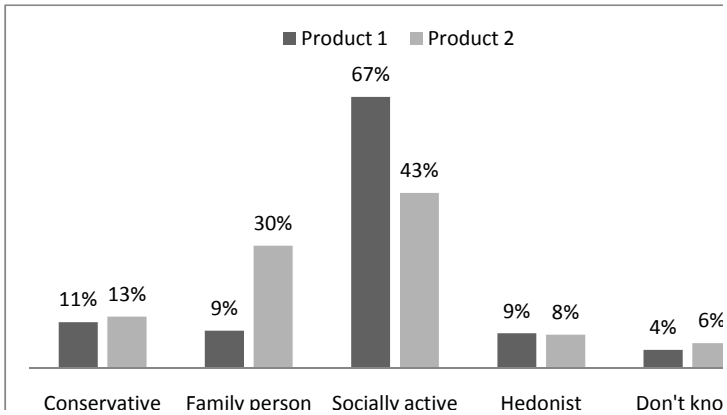

Fig. 12. The presumed lifestyle of products' customer

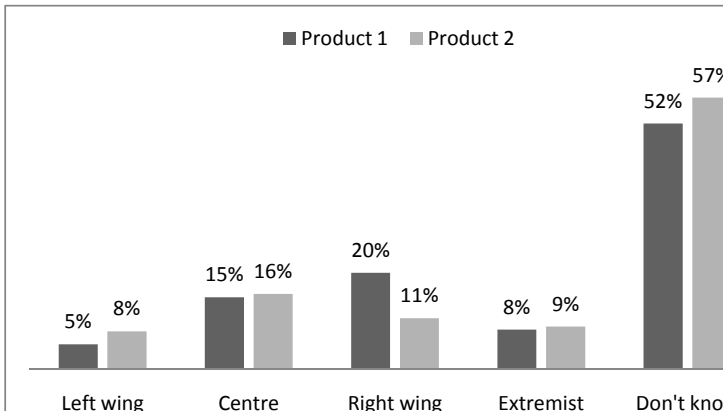

Fig. 13. The presumed political orientation of products' customer

Let's consider as relevant the criteria that achieved more than 50% for at least one of their values. So, the list is (the items marked in bold being the most relevant):

- **gender;**
- **age;**
- **level of education;**
- field of activity;
- position within organisation;
- **income;**
- type of residence;
- cultural level;
- lifestyle.

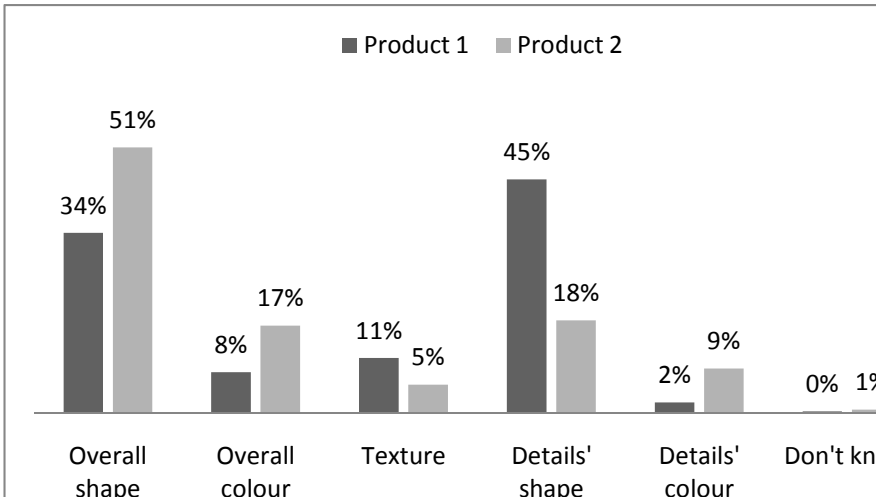

Fig. 14. The product's aesthetic feature that influenced the assessment

The criteria *Family Size* and *Political Orientation* scored poorly and should be neglected.

The aesthetic features that influenced the assessment are displayed in Figure 14. The most important was the shape. The overall shape (the precise cube shape) of the second ashtray and the spring shape of the cigarette holder of the first ashtray were the most influential. The colour and texture scored weakly. More relevant was the plastic red of the second ashtray than the metallic shine of the first one.

The Cronbach alpha coefficients were 0.26 for the first ashtray and 0.41 for the second. This implies that the set of criteria was not properly chosen, as it has been already noticed.

The customer profiles for the two products that resulted from the experiment are as follows. It should be noticed that the second profile has some uncertain features, comparative with the first one which has no uncertain features.

The first product was the *Spiral Ashtray*. The associated customer profile of this elegant ashtray is:

- male;
- mature;
- graduate of high school;
- employed in finance or banking sector;
- senior leadership;
- high salary;
- single or married with no children;
- lives in luxurious flat;
- connoisseur of culture;

- socially active.

The second product was the *Cubo Ashtray*. The associated profile of this plastic / metallic ashtray is:

- no gender in particular;
- young;
- graduate of university, maybe only of high school;
- any urban field of activity;
- junior leadership or clerical position;
- average salary;
- single;
- lives in the usual flat in a block;
- average knowledge in culture;
- socially active.

4. Conclusions

The conclusions of this experiment are the following:

- The product's aesthetic features are correlated to customer's demographic profile.
- Significant design can be assigned easily to a customer's profile. Average aesthetic features cannot allow an easy determination of customer's profile.
- The most relevant criteria for market segmentation are: gender, age, level of education and income.
- Political Orientation is not a reliable criterion for market segmentation (at least in Romania).
- Shape is a far more influential aesthetic feature than colour in identifying the customer's profile. This is true for the overall shape, but also for the shape of details.

REFERENCES

[1] *Stuart Pugh*, Total Design, Addison-Wesley, 1991
[2] *K. Ulrich, S. Eppinger*, Product Design and Development, McGraw Hill, 2007
[3] http://www.jonkolko.com/educationCourse215.php, 2010
[4] *K. Holtzblatt, J. Burns Wendell, S. Wood*, Rapid Contextual Design: A How-to Guide to Key Techniques for User-Centered Design, Morgan Kaufmann, 2004
[5] *Peter Dormer*, The meanings of Modern Design, Thames and Hudson, 1990