

An Empirical Study from Industrial Design Engineering Students' Product Experiences with Intelligent Every Day Used Product

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Abstract: This paper is investigating the latent factors affecting Industrial Design Engineer students' everyday product use and analyse their product experiences. Different and distinct parts of product experience are frequently investigated, like usability, aesthetic judgments, or brand preferences. In this article authors examined a holistic aspect. Q-methodology is used for data collection and the sample is analyzed with a modified factor analysis. This method provides researchers a systematic and rigorously quantitative mathematical tool for examining human subjectivity. Q-set construction was the first step in order to reach the targeted aim. It was based on product experience case studies derived from students' everyday product interactions. Focusing on the group of intelligent everyday product was the next step. Q-sorts (the data collection) concentrated on this type of human-product interactions with 23 products chosen by Q-sorters. After the factor analysis a combination of experience structure was shown by means of 8 different factors.

Keywords: Q-methodology, Product experience, Industrial Design Engineer student, Intelligent product, Subjectivity

1. Introduction

Everyday experiences involve people who simply use and enjoy products. Industrial Design Engineer (IDE) students in Budapest University of Technology and Economics (BME) study designing new products and everyday product experiences. This also includes improving products that people use in everyday life. They need to learn about product construction and engineering, and of course material properties. In addition they are focused on social developments and design trends and are taught to apply their creativity in a systematic way. Students need to take into account what will happen to the product after being discarded that is why they are also concentrating on sustainability and environmental issues. Therefore IDE students meet every aspects of product experience during their studies.

This article focuses on IDE students' own product experiences using personal intelligent products in their everyday lives. According to Herring (1988), an intelligent product is both a product and a process and very difficult to define it. The product is the actual outcome of the process. The process, on the other hand, is a systematic way of producing something. Authors used the concept of intelligent product in this paper as a wide range of product meaning both software and hardware as well. One of the issues is that how creativity is displayed in IDE students' own intelligent product experiences. The other issue is the motivation of creating his or her product choices. The third issue is that what kind of feelings, or emotional relationships, or motivation factors can be detected about personal intelligent products in addition to creation and creativity. These questions are subjective and related to personal feelings.

Subjectivity, for product experience purpose, is defined simply as a person's point of view on personal importance of human-product interaction factors. Although it is clear that human actions are motivated on the basis of subjective perceptions and interpretations, the question is how and why exactly people see their world as they do. Following *Hekkert (2006)*, three components or levels of product experience have been separated: aesthetic pleasure, attribution of meaning, and emotional response. These levels depend on the humans' subjective opinions, judgments and feelings.

In this study we have to measure subjectivity and experience, and Q-methodology is an ideal tool to examine these types of research questions. Q-methodology is a relatively little-known form of research methodology within social and engineering science, even though it was improved more than 80 years ago (*Barry and Proops, 1999*). It is a qualitative approach based on mathematical statistical tools, which provides the study of subjectivity, a person's viewpoint, opinion, and attitude. In this paper Q-methodology was applied on IDE students' subjective feelings.

2. Theoretical background

2.1. Product Experience

Before starting the discussion on human-product interaction experience from the point-of-view of intelligent products' perspectives it is important to summarize the theoretical background of product experience. Product experience always results from some interaction between user and product. This interaction is not necessarily restricted to instrumental or non-instrumental physical action, but many also consist of passive (often visual) perception, or even remembering or thinking of a product (*Desmet, Hekkert, 2007*). Human-product interaction and product experience is closely interwoven. *Figure 1.* provides a model of human-product interaction (*Hekkert, Schifferstein, 2008, 3*).

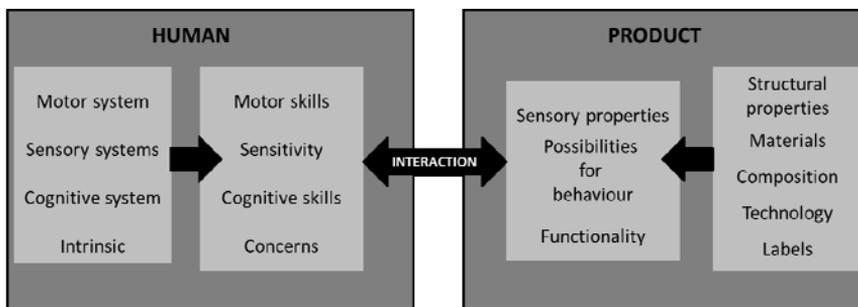


Figure 1

Modell of human-product interaction

Source: *Hekkert, Schifferstein, 2008, 3*).

Humans are interacting with their environment (and the products) through motor system, sensory systems, cognitive system and intrinsic constructs. Intelligent products have numberless connections with humans regarding product experience. They interact with humans on concrete levels:

- visual appearance (shape, colour, material, display),
- tactual experience (touch of controls, weight etc.),
- auditive experience (for example the sound of “click” or the ringtones etc.) and
- multisensory experience (e.g. playing with computer games or using navigation tool etc.)

On the other hand intelligent products interact with humans on more abstract, subjective, emotional “symbolic” levels, and they help to create the “owner’s loyalty” like aesthetic experience (for example the subjective meaning of “beauty”), brand experience (like the producer’s image, or the consumer’s self-image when possessing the product), social level (the experience of belonging to a group), shopping experience, and the satisfaction with dealer service. It is clearly

visible that intelligent products' product experience is significantly more than the using experience itself.

Colours, shapes, sounds (or music) and words always have an emotional meaning. This emotional meaning is in part innate but also learned from our cultural and social environment. It is a question of design: design elements can only be successful if they hit the desired emotional spot. Cues, sensory, verbal and visual stimuli must find the best compromise among the level of product, the whole purchase and the consumption process. In this area it is increasingly difficult to compete with only the quality of product therefore new management solutions are formed focusing on emotional experiences targeting user groups. This new focus appears in emotional and symbolic product attributes emphasizing positioning, and the aim of product development is to impress all senses of the customer. In order to be successful on the market, the brand of a product must have a clear emotional place and message in the mind of the consumer (*Hausel, 2008*). This emotional brand essence results from the sum of all experiences coming from human-product interaction on both tangible and abstract levels. The subsequent implementation in marketing and brand communication is derived from the emotional brand positioning as a new and emerging field of marketing.

2.2. Q-methodology

2.2.1. Historical background

This presented work is on theoretical basis of the Q-methodology concept. Q-methodology is primarily an exploratory technique (*Watts and Stenner, 2005*). The idea behind the development of this methodology was to map the subjectivity of human mind. The examples of subjectivity are countless and include aesthetic judgment, appreciation of art, preferences for music, families' experiences after tragic events, and attitudes towards political groups. These were difficult - if not impossible - areas to be measured and reported scientifically by the conventional quantitative mathematical statistical methods available at 30's. Q-methodology emerged as a direct result of that deficiency. In the 1970s-1980s advanced computer programs appeared to perform mathematical statistical analysis of data derived by the Q methods. Authors have built up a model that deals with questions of environmental awareness and individual attitude.

Nowadays, Q-sorting has several benefits (*Thomas, Watson 2002*):

- Q-sort offers a means for an in-depth analysis of a small sample;
- It is useful in exploratory research;
- A well-founded theoretical background leads and assists its usage although the practical use is yet insignificant;
- It captures subjectivity in operation through a person's self-reference;
- Participants should be randomly selected, this helps to easily build samples;

- It may be administered over Internet; (but in this study we made personal interviews in a conventional way)
- Analysis techniques help protect respondent's self-reference from researcher influence.

Q methodology "*combines the strengths of both qualitative and quantitative research traditions*" (Dennis and Goldberg, 1996:104, Sell and Brown, 1984). As such, subjectivity is always anchored in self-reference, that is a person's internal frame of reference, and, Q studies from conception to completion adhere to the methodological axiom that subjectivity is always self-referent. (McKeown and Thomas, 1988).

2.2.2. Statistical background

Q analysis as a tool of mathematical statistical analysis typically includes sequential application of three statistical procedures: correlation analysis, factor analysis and the computation of factor scores. (McKeown and Thomas, 1988). Factor analysis is a statistical method of data reduction used to identify a small number of latent constructs (factors) that explain unobservable relationships among a large number of variables. The main applications of factor analytic techniques are:

- (1) to reduce the number of variables; and
- (2) to detect structure among variables, in order to classify or reduce the variables.

Therefore, factor analysis is applied as a data reduction or structure detection method. Firstly, Q-methodology inverts the factor extraction and correlates the person over a set of variables instead of opposite. The "conventional" or "usual" factor analysis is known as R-technique. (Cattell, 1966 and Minke, 1997) In this way, as it can be seen in the left part of Figure X the data matrix has variables as columns and subjects as rows. The data matrix factored in Q-technique as the right part of Figure 2 shows subjects as columns and variables as rows. In R-technique, more subjects (Persons) than variables are needed but in Q-technique, we need more variables than subjects (Thompson, 1980). The results of a Q-technique factor analysis differ from a usual typology in which each person fits one, and only one discrete category. Unless exceptionally simple structure is achieved with the factor analysis, each person may be related to more than one typological factor in Q-technique (Gorsuch, 1983).

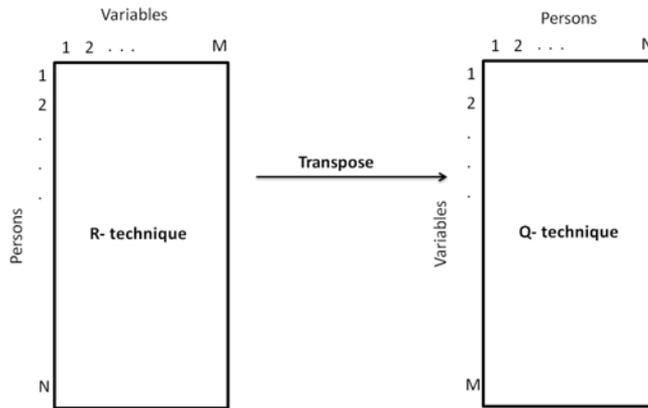


Figure 2:
The difference between R-technique and Q-technique data matrix
Source: own compilation

Secondly, Q-methodology is looking at the way the isolated factors – which are in the case of Q-methodology represent persons or more precisely their Q-Sorts – are rotated. Therefore, people of the same group or having the same factor will have a similar pattern of chosen statements. Q method is designed to understand the subjective expressions and viewpoints of participants and try to group them (*Watts and Stenner 2005*).

The population, in the conventional research methodological term, refers to the group of people in which the results of the study can be applied. The sample refers to those people on which the study is actually been conducted. Classical test theory assumes that each person has a “true score” (T) that would be obtained if there were no errors in measurement. A person's true score is defined as the expected number-correct score over an infinite number of independent administrations of the test. Unfortunately, test or questionnaires never observe a person's true score, only an observed score, X. It is assumed that observed score = true score plus some error:

$$X=T+E \quad (1)$$

where,

X: observed test score [-]

T: true test score [-]

E: error [-]

In Q methodology, the population and the sample is not as rigidly defined as in quantitative research and have no strict regulation in the connection between them. The sample needs not to be randomly drawn from the population. Often the persons are chosen for the research because they have special relevance or hold

strong views about the topics. Also the sample size can be relatively small. In fact, the subjective distortion (the “error”) can be studied with Q methodology.

3. Objective and Research Method

3.1. Objective

The first reason to adopt the Q methodology in the field of product experience is that it allows the participants to express their subjectivity without confining them to the researcher’s categories. Through a “mediate product”, (in this study the mediate product will be IDE students’ personal used intelligent accessories) and by applying Q-methodology, subjective experience category can be achieved without influencing them to the researcher’s preliminary visions. The model of methodology can be seen in Figure 3:

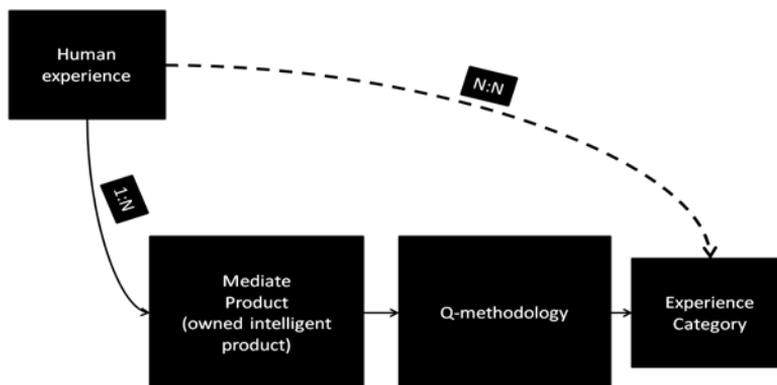


Figure 3:
Model of methodology
Source: own compilation

Table 1:
Selected objects by participants

Product	Q-sorter Gender	Q-sorter Age
Cannon MP620 printer	Female	23
Compaq laptop	Male	26

Dell Inspiron laptop	Female	24
Dell laptop	Female	25
Dicota PC mouse	Female	25
Farmerama flash game	Female	22
Fujitsu laptop	Female	23
GoogleCrome browser	Male	23
Igo8 Navon N47	Male	26
Innocentive.com	Male	23
IPhone 3G	Female	24
IPod nano 2G	Male	26
IPod nano 3G	Female	23
IPod touch 4G	Male	30
Istockphoto.com	Male	23
Logitech loudspeaker	Male	24
Mac Book laptop	Female	26
MSI laptop	Female	23
Nikon D90 camera	Male	30
Nokia 6020 telephone	Male	25
Nokia E51 telephone	Male	27
Prezi.com	Female	23
Sony Ericsson K550i telephone	Male	24

This research deals with intelligent products used every day and the related user attitudes are based on 23 objects of Q-methodology. Participation was voluntary, without any gift or payment. Objects were selected by participants (Q-sorters). IDE students were asked to pick a weekly or more often used personal intelligent product (software or hardware) as the object of Q-sorting. The participants' attitude to the selected product was not preconditioned. Only their first-hand experience and the personal use were important, and not their feelings or content of relationship with the product. *Table 1* shows the chosen products, and the participants' most important demographic data (gender and age).

3.2. Method

Having identified ‘product experience’ as an area of interest for the research, authors had to generate a series of statements on this topic. The significant source for statements was 10 “Product experience case studies”, but statements were also used from academic literature (*Hekkert Schifferstein, 2008*). Intrinsic constructs have generated more than 150 possible statements. After some initial piloting, 52 statements were found to be reasonable, both for the Q-sorter and for the research aim as well.

Then the Q-set was disposed to Q-sorting. 23 Q-sort completed with selected objects. First the Q set was given to the respondent in the form of a pack of randomly numbered cards. Each card contained one of the statements from the Q set, and the number was on back of the card.

The respondent was instructed to rank the statements according to the basic rules of Q sorting, because the Q-sort distribution was forced in a way, that a certain number of items were prescribed for each rank. The subject was free, however there was a barrier (number of slots) to place an item anywhere within the distribution (*McKeown and Thomas, 1988*). The score sheet was discrete, ranging from “most not-significant” to “most significant”. Q-sorting began with pre-selection. Participants were asked to select the least relevant 10 statements, that got to the middle of the distribution with 0 score on scale. After that they had to order statements on a pre-prepared scale as Figure 4 demonstrates.

After Q-sorting, a very short follow-up interview was applied to capture the subjects’ reasoning for ranking the various Q-samples in their unique way. The analysis of the Q sorts was the next step. It is a purely technical, objective procedure, with using factor analysis. Data analysis involves three proceedings applied in order: correlation analysis, factor analysis and computation of factor scores. To assist in the statistical analysis of Q data IBM SPSS Statistics 19 software was used. In the course of factor analysis Varimax rotation was used. The final step before we started to describe and interpret the factors was the calculation of the statements’ factor scores in every given factor. The whole method’s set development, data collection and data analysis process is summarized by Figure 5.

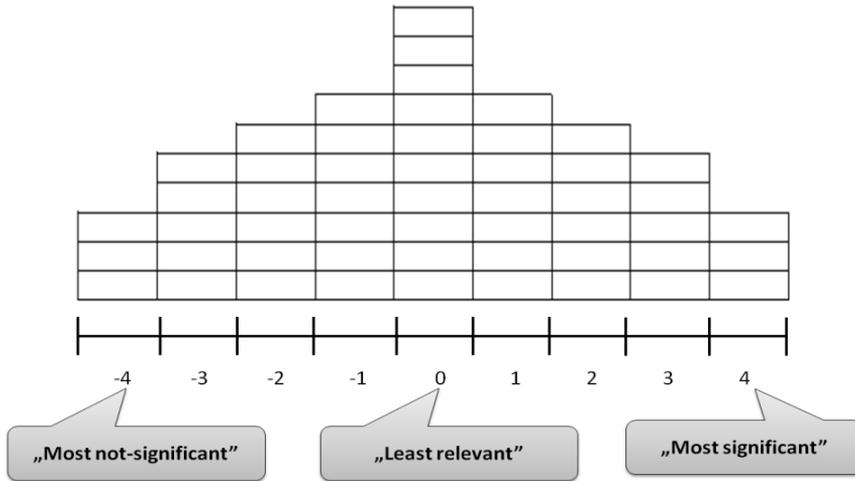


Figure 4:
Applied 9 point scale; and the taken quasi-normal formed distribution
Source: own compilation

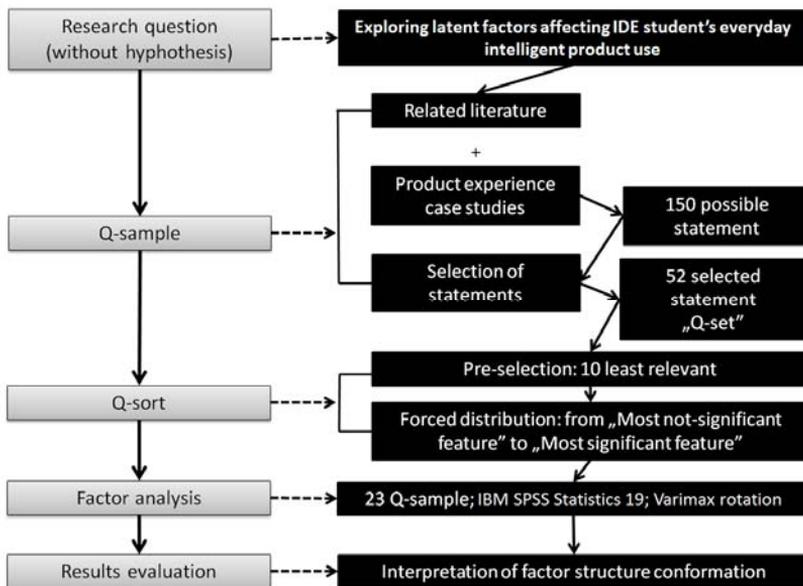


Figure 5
Set development, data collection and data analysis process
Source: own compilation

4. Results

First, the sample correlation matrix was investigated with Bartlett's test of sphericity. Bartlett's test is used to examine the hypothesis that the variables were uncorrelated in the sample. The result of the test was that each variable correlated perfectly with itself, but had no significant correlations with the other variables. On the other hand, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was calculated to examine the appropriateness of factor analysis. Our sampling's KMO measure of sampling adequacy was 0.576, this value (between 0.5 and 1) indicates that the factor analysis was appropriate.

The eigenvalue represents the total variance explained by each component (factor). Scree plot is a plot of the eigenvalues against the number of components (factors) in order of extraction. On this sample we explored 8 different factors with eigenvalue higher than 1. Figure 6 shows the scree plot and the resulting factors.

Rotated factor matrix (**Error! Reference source not found.**) contains the factor loadings of all the observed product experiences (variables) on all the factors extracted. The name of the obtained factors is based on the content of the factor. It derived from the factor scores which were calculated from every statement on each resulting factors. In this crucial interpretive step of the research, it is important that all statements participate in describing meaning to the factors obtained. By the highest and lowest factor scores for each statement characterized each factor.

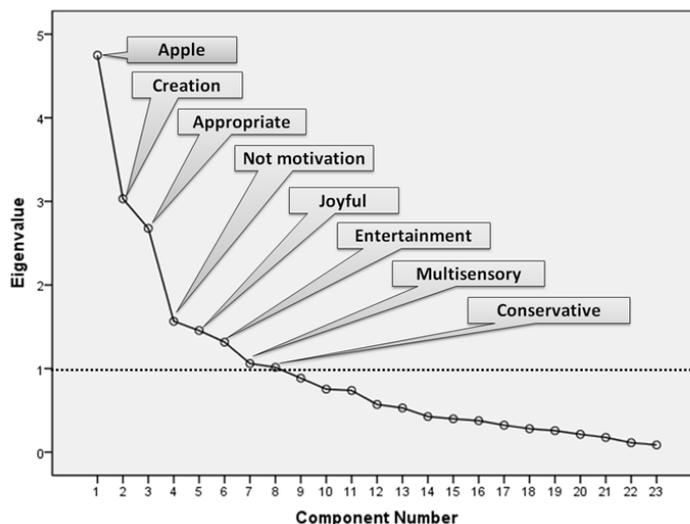


Figure 6
Scree Plot with the resulting 8 factor's eigenvalue
Source: SPSS 19

The first factor unexpectedly represents only **Apple** products. Pridefulness and positive feelings connected with the brand are the most significant experiences describe the factor and Apple products. It is very interesting that only Apple products belong to this factor, but from different product category, such as iPod nano media players and Mac Book laptop. The highest factor scores were related to the following Q-statements:

- Owning the product makes me feel proud.
- Using this product makes me relax.
- I feel that possessing this product refers to a standard of living of higher quality.
- The product in itself has an aesthetic appearance.
- Owning the product makes me feel special.
- The product is good against boredom.
- Possessing this product's brand means a lot to me.
- Using the product can easily become a regular habit.

The lowest factor scores are supported the highest scores. This product experience is the least of all annoying, and rather amusing than effective. These products are not compatible with other products in its category it is a crucial point that makes the owner feel special.

- Using the product is annoying.
- By using the product I can be more effective.
- It also contributes to the experience that this product is compatible with almost everything in its category.

As it can be seen on *Figure 6* and the second column of **Error! Reference source not found.**, the second factor comes out from some experience of **Creation**. Software products connected with work or other creations belong to this type of experience. The following statements describe the Creation factor:

- The product helps me to exploit my creativity.
- The product allows me to show how smart am I.
- It allows me to explore my abilities.
- The product allows me to manifest my fantasy.
- The product offers wide range of combinations.
- The product gives the experience of success.
- The product motivates me to use it.
- By using the product I can be more effective.

The lowest factor scores reveal that these products are exciting to use, and well-designed.

- Using the product is boring.
- The product design is boring.
- Using the product is annoying.

The third, fourth and fifth factors similarly belong to the experience of use, or experience of usability. These factors are different from the users' feelings which are related to the usability. The statements with lowest factor scores helped to

determine the difference among these three factors. The third factor was named **Appropriate**. Products used every day, such as printer, laptop and PC mouse, appertain to the factor of experience of “Appropriate”. The 3. factor only refers to usability and does not contain creation content. The following statements had the highest factor scores:

- The usage of the product always has a goal.
- This product impresses me through sounds.
- The function and purpose of the product is recognizable by its appearance.
- The product can be used in private or in public environment.
- The product has ideal size.
- The product does not have any unnecessary functions.
- The product is easy to use.
- The product offers a wide range of combinations.

The lowest factor scores instance that this type of experience describes an easy to use product, but without creation:

- The product allows me to manifest my fantasy.
- Using the product is tiring.
- Using the product is annoying.

The fourth factor was named **Not motivation**. The statements with the highest factor scores have a very analogous content with the third factor:

- The usage of the product always has a goal.
- The product is easy to use.
- The product can be easily protected from damage.
- Using the product can easily become a regular habit.
- The product provides high level of experience for both sexes.
- The brand and the name are easy to recognize.
- The function and purpose of the product is recognizable by its appearance.
- By using the product I can be more effective.

Statements with the lowest factor scores allude to the real dissimilarity with the third factor. The third factor described more pleasant feelings than mentioned in the fourth factor. The most not-significant statements report the more unpleasant experiences, without happiness and motivation to use.

- Gives me self-confidence.
- Using the product makes me happy.
- The product motivates me to use it.

Table 2/A
Rotated factor matrix: Products and obtained factor loadings (1-4 factor)

	1. Apple	2. Creation	3. Appropriate	4. Not motivation
iPod touch 4G	0,809	-0,053	-0,069	0,154
iPhone 3G	0,773	0,029	0,029	-0,242
iPod nano 2G	0,709	0,181	0,234	-0,038
Mac Book laptop	0,564	-0,105	0,006	0,1
iPod nano 3G	0,518	-0,244	0,157	-0,382
Istockphoto.com	-0,003	0,812	-0,003	-0,104
Innocentive.com	0,004	0,805	0,021	0,053
Prezi.com	-0,055	0,749	0,184	-0,014
Dicota PC mouse	0,06	0,029	0,83	-0,098
Cannon MP620 printer	0,118	-0,021	0,804	0,164
Fujitsu laptop	-0,151	0,266	0,471	0,077
GoogleCrome browser	-0,241	-0,288	-0,037	0,595
MSI laptop	0,05	0,169	0,574	0,583
Dell laptop	0,183	0,371	-0,112	0,564
Dell Inspiron laptop	0,246	0,125	0,037	-0,004
Compaq laptop	0,231	0,36	0,174	-0,082
Farmerama flash game	0,204	-0,105	0,056	0,009
Logitech loudspeaker	0,189	-0,095	0,361	0,016
Igo8 Navon N47	0,14	0,223	0,076	-0,08
Sony Ericsson K550i telephone	0,024	-0,034	0,243	0,214
Nokia 6020 telephone	0,133	0,039	0,338	0,446
Nokia E51 telephone	-0,131	-0,088	0,242	0,036
Nikon D90 camera	0,465	0,086	-0,049	0,035

The fifth factor is, to some extent, similar to the third factor. It was named **Joyful**, and it belongs to everyday product usability, without special experiences, but with more significant amusement than the third and fourth factor. The fifth factor contains more positive feelings related to the brand and the brand evoked emotions.

- By using the product I can be more effective.
- Owning the product makes me feel proud.
- It also contributes to the experience that this product is compatible with almost everything in its category.
- The product in itself has an aesthetic appearance.
- The brand and the name are easy to recognize.
- Using the product can easily become a regular habit.
- The product helps me to show how I feel about myself.
- The product allows me to manifest my fantasy.

The most not-significant statements refer to the facts that it was not a unique and special experience with products, but the usage is not boring:

- Using the product is boring.
- I feel that possessing this product refers to a standard of living of higher quality.
- If I have problems with the use, help and guarantee is offered by the Producer.

The sixth factor adds **Entertainment**. Two products represent this experience. The flash game speaks for itself, but the post interviews elicited that the loudspeaker was a tool that had been used more for leisure time activities. The highest factor scores were related to the following Q-statements:

- The product is good against boredom.
- The function of the product can be easily understood.
- The product is easy to use.
- Using the product makes me happy.
- The product allows me to manifest my fantasy.
- The product provides high level of experience for both sexes.
- The product design makes me happy.
- The product never disappoints me.

Statements with the lowest factor scores confirmed the spare-time experiences, usage without goal and special emotions:

- Owning the product makes me feel special.
- The usage of the product always has a goal.
- Possessing the product means a lot to me.

Multisensory experiences belong to the seventh factor. These experiences based on touching and hearing and seeing, integrated with some brand connected emotional feelings. The following statements had the highest factor scores:

- This product impresses me through sounds.

- By using the product I can be more effective.
- It is a multimodal product experience.
- The use of the product is regulated in some aspects.
- This product impresses me through touch.
- The design and the quality of the available accessories go together with the product.
- I feel that possessing this product refers to a standard of living of higher quality.
- Using the product can easily become a regular habit.

Statements with the lowest factor scores reveal the products' weaknesses. Experiences belong to typical cell phone usage, because mobile phones almost always contain unnecessary extra functions. In this case these products are not status symbols, but only a product used every day without elevated emotions.

- Owning the product makes me feel proud.
- The product provides high level of experience for both sexes.
- The product does not have any unnecessary functions.

The last factor is named **Conservative**. This factor contains very mixed feelings. These are trustworthy classical products without inordinate emotional feelings. The brands of these products are important in this particular case. Nokia and Nikon is very similar; they are long-standing, reliable, but not typically "love brands", like Apple in the first factor. The highest factor scores were related to the following diverse Q-statements:

- The product design is boring.
- The product does not have any unnecessary functions.
- The product requires using my logical sense.
- The product has everlasting design.
- The product is good against boredom.
- The brand and the name are easy to recognize.
- The product can be used in private or in public environment.
- The function and purpose of the product is recognizable by its appearance.

Statements with the lowest factor scores confirmed the conservative experiences, usage without excitement:

- The product is always in fashion.
- It also contributes to the experience that the product is unique.
 - The product design makes me happy.

Table 3/B
Rotated factor matrix: Products and obtained factor loadings

	5. Joyful	6. Entertainment	7. Multi-sensory	8. Conservative
iPod touch 4G	0,16	0,209	-0,147	0,067
iPhone 3G	0,246	0,037	0,103	-0,026
iPod nano 2G	-0,082	0,152	0,329	-0,039
Mac Book laptop	0,349	-0,189	0,056	-0,487
iPod nano 3G	0,206	-0,001	0,197	-0,074
Istockphoto.com	0,035	0,234	0,061	-0,046
Innocentive.com	0,063	-0,276	0,184	0,115
Prezi.com	0,315	-0,292	-0,04	-0,211
Dicota PC mouse	0,186	0,075	-0,011	0,083
Cannon MP620 printer	0,019	0,034	0,167	0,208
Fujitsu laptop	0,018	0,404	0,166	0,095
GoogleCrome browser	0,083	0,368	0,288	0,076
MSI laptop	-0,045	-0,027	0,116	-0,253
Dell laptop	0,277	0,159	0,109	0,34
Dell Inspiron laptop	0,807	0,046	0,008	0,026
Compaq laptop	0,623	0,029	0,251	0,07
Farmerama flash game	0,025	0,776	0,08	-0,054
Logitech loudspeaker	0,278	0,588	-0,108	0,453
Igo8 Navon N47	0,139	0,019	0,852	-0,023
Sony Ericsson K550i telephone	0,454	0,215	0,493	0,145
Nokia 6020 telephone	-0,096	0,101	0,476	0,353
Nokia E51 telephone	0,085	0,005	0,133	0,778
Nikon D90 camera	0,083	-0,399	-0,317	0,496

There are 4 products in the sample which cannot be clearly classified only one factor in the structure. MSI laptop belongs to the “Not motivation” factor (factor load: 0,583), but in “Appropriate” factor has hardly differed from factor load, 0,574. This means that the product relates to both experiences. The content of MSI laptops' Q-sort equally participated in both factors.

Sony Ericsson K550i telephone and Nokia 6020 telephone mainly belongs to the “Multisensory” experience (factor loads: 0,493 and 0,476). But Sony Ericsson K550i telephone is only slightly less factor load in the “Joyful” factor (0,454). According to follow-up interview, in this case the subject uses his telephone to listening to music, taking photographs too, and likes the brand. The owner of Nokia 6020 telephone said in the follow-up interview that he wanted a new mobile phone soon. The products belong primarily to the “Multisensory” factor still because of multimodal experiences.

Nikon D90 camera primarily belongs to the “Conservative” factor, with 0,496 factor load, but in “Apple” factor has similarly high factor load, 0,465. The content of the Q-sort equally participated in both factors. The follow-up interview revealed that the owning of Nikon D90 made the Q-sorter feel proud, like the Apple products.

5. Conclusion

The factor structure is not based on products category. The basis was the user's experience. For example the laptops can prove this. In the research five different laptops with four different brands were examined. After the analysis, in the formed factor structure, the laptops belong to four different factors because of the different related experiences. Obviously, MacBook laptop belongs to “**Apple**” experience. Fujitsu laptop is an “**Appropriate**” product to the owner. MSI laptop is a mixed experience between “**Appropriate**” and “**Not motivation**” category. In the research we had two Dell laptops. Both of them are owned by female users. For the first user her Dell laptop has “**no motivation**” to use. According to the follow-up interview this user owns her laptop for 2 years. The other female with the Dell Inspiron laptop felt “**Joyful**” to the using experience. It turned out from the follow-up interview, she had a new laptop for 2 months, and she just enjoyed the experience of the discovery.

The factor structure is not based on products' brand, except for Apple. In addition Dell laptops and two Nokia telephones were examined. The first experience with Nokia 6020 telephone belongs to the “**Multisensory**” factor. The other product, Nokia E51 telephone was with “**Conservative**” factor.

Creation is very important when somebody wants to be a designer. In this study the experience of creation appeared as a separated factor.

The most interesting result of the research was the “**Apple**” factor. The brand and the company are in accordance with the needs of the IDE students. Apple never published a mission statement, but the main milestones could be to “make great

products”, “constantly focusing on innovation”, “believing in the simple, not the complex”, “need to own and control the primary technologies behind the products”. These buzzwords are coincidence with what IDE students learned, for this reason these products has special place in minds.

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