

Research of product design consumer perception ¹

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Abstract

Professionals perceive product design as an essential factor in product competitiveness, especially in international markets. To achieve that, customers and buyers must accept the quality of the offered product design. Especially by mass-produced products are producers facing a lot of customers with limited knowledge about design requirements. Appropriate communication is necessary to persuade potential customers about design quality characteristics. Paper utilizes previously formed customer classification based on quality perception. It discusses the possibility of applying such classification for product design perception too. Different methods and tools to prove the relevance of the presented model are analyzed to form an optimal model for future research. The result of such research would be the optimization of the use of product design in communication strategy.

Key words

Product design, consumer perception, market research, market survey.

JEL Classification: M31, M39, L15, D11

Received: 15.6.2020 Accepted: 27.8.2020

Introduction

Very soon, economic theory after a period of labor theory and expectation of perfect competition adapted the real condition of the imperfect market and tried to develop a concept that allows simulating real decisions made by market operations (Strhan, 2018). As Bergh et al. state in their contribution information asymmetry, a condition wherein one party in a relationship has more or better information than another, is a cornerstone of management research (Bergh et al., 2019, p.123). Their analyses of leading management journals show the increasing importance of research based on information asymmetry. They found two articles dealing with information asymmetry during the 1980s. The number progressed rapidly to 40 during the 1990s and again to 96 during the 2000s. In the non-finished last decade, they found 85 already published contributions (Bergh et al., 2019, p. 124).

¹ VEGA 1/0543/18: The Importance of Product Design in Consumer Decision-Making and Perspectives to Increase the Impact of Design on Creating Competitive Position of Companies Operating in the Slovak Republic

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Reason of such interest is that marketing relationships between buyers and sellers often are characterized by information asymmetry, in the sense that the supplier possesses more information about the object of an exchange (e.g., a product or service) than the buyer (Mishra, Heide, Cort, 1998, p. 277).

Suppliers can opportunistically exploit customers' inability to assess quality accurately. Suppliers without the skills required to provide certain quality levels might misrepresent themselves by making false quality claims (Eisenhardt, 1989). Besides that, in some markets, a moral hazard problem might exist. Suppliers can easily influence the level of quality provided by each transaction (Rao et al., 1997). Adverse selection and moral hazard problems concern both customers who cannot easily evaluate the object of exchange and those suppliers whose strategies base on quality but whose offers are indistinguishable from lower-quality ones (Mishra, Heide, Cort, 1998, p. 277).

Of course, the situation of information asymmetry is well known. The consumer decision process is complex, and several factors forcing consumers to buy the chosen product describe it (Zecca, Rastorgueva, 2016, p.19). In table 1, we can see factors, which influence consumer decisions in the food domain. Almost by all factors, we can identify the risk of information asymmetry. Sensory factors by packaged goods are base on existing experience. Psychological factors very often hide intentions and actions.

Tab. 1 The main factors affecting consumer behavior in a food domain

Psychological Factors	Sensory Factors	Marketing Factors
Attitude	Visual Appearance	Price
Risk	In-Mouth Texture	Label
Expectations	Flavour	Brand
Socio-Cultural Effect	Odour	Availability
Lifestyle and Values		

Source: F. Zecca, N. Rastorgueva 2016, p. 21

The theory describes the way how to diminish the risks and negative impact of information asymmetry. Signaling theory, as support by information asymmetry, focuses primarily on the deliberate communication of positive information to convey positive organizational attributes (Connolly et al. 2011, p.53).

The impact of different signals can differ. The receiver can detect some signals of quality detect readily than other signals. That is why management scholars sometimes suggest that signals may be "strong" or "weak" (Connolly et al. 2011, p.53). As we can find several forms of signaling and different factor where signaling would be important, it is a natural task for producers to find methods for identification of appropriate forms of signaling.

1 Methodology

1.1 Consumer classification based on product attributes perception

In previous work, we discussed the possibility of classifying customers according to the perception of quality signals using a matrix system (Strhan, 2019). We created two axes, to differentiate four basic types of customers. **One axis** is built on the basis of what types of attributes are for customers more critical. The first row represents customers who prefer **objective attributes**, comparison of products, and evaluation ability. The second row includes customers who tend to evaluate **products subjectively**, emotionally, and on the basis of senses.

The second axis is representing the extrinsic and intrinsic approach of the customer. **Intrinsic perception of quality** is based on an individual view, where the subject decides without having in mind other products or conditions of the market. Decisions are made on a dual basis "accept – not accept." By **extrinsic approach**, customers compare conditions of a product purchase, i.e., competitive products, available substitutes, and place where products are purchased. Quality perception is then partly influenced by factors, where the producer has limited control.

Using two axes we created four basic types of customers according to the perception of quality. Short characteristics of every type you can find in table 2. Although we made some first proof of this classification (Strhan, 2019) we still consider it as a theory in the verification phase.

As we are working on scientific research concentrated on product design, we applied this classification on product design perception. There are some similarities between these two systems although there are differences as well.

Tab. 2 Consumer quality perception matrix

Evaluator	Contestant
<ul style="list-style-type: none"> • Rationally and critical customer • Looks at product features and other attributes • Believes himself to be able to evaluate products and parameters • Has not trust in marketing and commercial activities 	<ul style="list-style-type: none"> • Rationally oriented customer • Does not believe in own ability to evaluate products • Trusts in inspection, market surveillance and self-regulation of the market • Searches for labels, certificates, references
Hedonist	Fashionist
<ul style="list-style-type: none"> • Looks at its/her own pleasure 	<ul style="list-style-type: none"> • Looking at products available on the market

<ul style="list-style-type: none"> • Sensory attributes are more important than objective parameters • Prefers products he/she has experience with • Oral recommendations are more trustworthy than marketing tools 	<ul style="list-style-type: none"> • Popularity considers as best prove of quality • Believes into limits of marketing manipulation • Positively reacts by must-have products
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Source: Own results

As mentioned above, the range of signaling forms by information asymmetry, limits company possibility to use them all. Although design perception is subjective, most customers do not believe in their ability to evaluate a design. Design is very often declared as a distinctive attribute of the product and presented as a competitive advantage. The consumer will accept it only by such communication, which is following their perception of signals.

We decided to use the analogy method, which is a success story for a cognitive science success story. The collaboration of data and psychological work with significant influences from philosophy, linguistics, and history of science, has led to a substantial degree of theoretical and empirical convergence among researchers in the field (Forbus et al. 1998, p.231) Analogy takes advantage of similarities between (the base) and a new domain (the target), using the relational commonalities as a basis for generating inferences that enhance comprehension of the new product’s benefits. The literature defines two types of analogy: between-domain analogies and within-domain analogies. First refers to the transfer of knowledge between two systems or concepts which remote conceptual domains, but which share a similar explanatory structure. The within-domain analogy pertains to the knowledge transfer of common surface attributes between concepts within highly similar domains (Ait El Houssi, 2004, p.18).

We used the customer's classification of quality signals as the base. We expect to use the same classification for perception (the target). The perception of both quality and design is very individual. Different forms and content of a communication influence perception of both quality and design. This similarity allows us to make such expectations. Of course, by design, the display of different forms of perception will be different. According that we could characterize four groups of consumer perception of product design:

'Evaluator' considers design as a value attribute. He is searching for confirmation of the effort to make the design as a distinctive attribute. As by quality perception, 'Evaluator' is the person looking for measurable attributes. By design perception, he/she is looking for a clear declaration of design elements.

'Contestant' accepts evaluated and awarded design as better than other available products. We can expect, he/she will perceive as better designs which were winning or successful at design competition, they were presented on an exhibition or have achieved other forms of reward.

'Hedonist' is a person who evaluates design by their senses. He positively accepts information describing sensitive attributes and association with senses. For him/her, signals should mediate the hidden part of sensitive characteristics.

'**Fashionist**' is consumer following in perception of design the principal trends. He/she is interested in design, which is accepted and recommended by celebrities. Get an award for good design is not necessary. It is sufficient that a famous designer or famous brand is creating it.

1.2 Research methods for classification prove

The main goal of contribution is to set appropriate methods for theory adjustment. Of course, plenty of instruments exists, but in our situation, we must look at financial and personal capacities that are available. Besides that, we must take into consideration the sensitivity of the topics. The task of quality, design, and marketing is relatively often discussed in media with a significantly simplified explanation. People have often accepted such an approach without using it in their real decision.

As by market research, we can divide the existing methods of proving into two categories, qualitative and quantitative methods.

Qualitative tools attempt to understand the underlying reasons and motivations for actions and establish how people interpret their experiences and the world around them. They concern with the quality of information and attempt to understand the underlying reasons and motivations for actions and establish how people interpret their experiences. Qualitative methods provide insights into the setting of a problem, generating ideas and/or hypotheses (MacDonald, Headham,2008, p. 9).

Qualitative research allows us to go better behind real consumer behavior. That makes is it more critical for the future (Žák, 2015, p. 149). On the other hand, it requires very often special knowledge about psychology and sociology to react during the research. Social surveys and questionnaires, interviews, discussion groups, workshops, observation, and visual techniques are the most used methods of qualitative research (MacDONald, Headham,2008).

By design, we are very often facing the unconscious by decisions made by customers. Personal declaration of behavior, attitudes, and values is the base for the explanation of own behavior. Unconsciousness can by there overlapped by rationality and moral principles. As appropriate methods for our goals, we can regard the observation method where researchers follow real behavior in a focus group. As the design is tightly associated with the formal appearance, we assume the use of visual techniques is proper.

Quantitative research is concerned with trying to quantify things; it asks questions such as 'how long,' 'how many' or 'the degree to which.' Quantitative methods look to quantify data and generalize results from a sample of the population of interest. They may look to measure the incidence of various views and opinions in a chosen sample or aggregate results (MacDonald, Headham,2008, p. 9).

Quantitative research creates data through a quantitative survey or finds answers on scientific questions by analysis of secondary data. As we develop a new Methodology, we can expect a lack of secondary information in that field. We must create our primary data through a developed survey. Although a quantitative survey expects a lot of cases

representing the population of interest, firms confirm, we can work with smaller sample group trying to discover elements of an accident by results.

2 Results and Discussion

According to the marketing literature, the design belongs to the actual level of product. It shows how the core customer benefit is manifested or made available for consumption (Schmidt, 2010). This level of a product is for consumer decisions even more critical than core products. On the other hand, research of design impact on the decision process is relatively hard. Although we mentioned product as an essential factor of competitiveness, the number of researches made in that field does not support that statement. We assume the problem is the identification of such design impact without dependence on product category and time.

We used an analogy with another system, where the perception of the product is limited. E-business is changing the structure of commerce. One of the main barriers for e-commerce is the fact that consumer perceptions are generally multimodal, where each sense provides optimal information in specific categories (McCabe, Nowlis, 2003, p. 431). In the case of an E-shop, perception is restricted only at vision in the moment mainly on a two-dimensional view). Purchase through e-shop eliminates other senses. By existing experience gathered through other senses by previous purchase, a customer can replace the actual perception. Without experience, visual perception and rational evaluation of information will remain the crucial aspect of the decision.

Limited transfer of information transferred toward the customer by E-shop sale is similar by process of design perception. Through experience with previous consumption, we can subconsciously evaluate if sounds, smells, or haptic information we have got are following created expectations. If milk smells like bread, a consumer will reject it not because of its bad smell, but because the smell is not appropriate. By design items, we are mainly speaking about a new product and its differentiation from existing market products. Although senses give us information, a customer (non-expert) lacks experience with the criteria of good design.

2.1 Verification of classification through quantitative method

The main form of market research recently is quantitative research. As we mentioned in the Methodology, we cannot use secondary data as they are missing. Risk by design perception survey is the use of loaded or leading questions, which hint the respondent on the expected answer. As we can use a word and visual presentation of product design only and categories are relatively close together, the risk of such fault is relatively high. It rises especially by the survey in the international environment using the English language.

One form of a quantitative survey could use a Methodology comparable with the comparison of product perception by E-shop sold products. In their study, McCabe and Nowlis selected two products called material product (bath towels and carpeting) and two geometric (videotapes and film rolls). Such use should reflect the importance of

sensual perception by different categories of products. Respondents had available three forms of product presentation – actual physical product, picture of a product, and a written description of a product (McCabe, Nowlis, 2003, p. 431).

Results showed that the ability to make choices (choose or reject the product) by material products was much more significant by actual product (95%,9) than by picture (86,2%) or product description (84,9%). The results were opposite to geometric products, and the actual product allowed the customer to decide in fewer cases (93,1%) than for example product description (94,5%) (McCabe, Nowlis, 2003, p. 431).

Looking at the developed classification, we can assume that especially the category of Hedonist will require actual product and ability to check the product by own senses. By quantitative research, presentation of the actual product is limited possibilities on visual presentation only. On the other hand, the proposed classification allows us to use different forms of the product description.

In that way, we will prepare four different forms of product presentations that suit the requirements of different customer categories.

Hedonists should prefer visual dominated presentations where pictures dominate the message.

Evaluator should consider as appropriate the combination of visual and informative description with clear visual presentation and formal description of the product.

Contestant will accept informative presentation with achievements of the product, including design awards, presentation of designer name, information about quality prove.

Marketing oriented description of products will use celebrity recommendation and brand ambassador statements, maybe in advertising form. Such a form of description should be attractive for customers who belong to the category of **Fashionist**.

As the first step, we will select different categories of products to avoid the different perceptions of design by think and feel products, or as mentioned above, geometric and material products. The second step would be the select product items for description. To create all forms of description, we should select products which have achieved response in several aspects. Products must have an exciting and awarded design, must be supported by advertising, and, at best, should be promoted by a celebrity. After that, we can create a questionnaire. We assume the electronic distribution of questionnaires, as we have only limited sources available and problems to achieve customers in different countries. For distribution, we will use the electronic form and social networks (Facebook, LinkedIn).

The survey should present in random order described products. Respondents should evaluate how they accept the presented product or eventually, how attracted they are by the product. Different product categories should avoid impact of product categories on respondent decision.

Our central hypothesis is that respondents will unconsciously prefer such a description, which is more suitable for their consumer category. The evaluation of the product does not play a role in that case. Significant is the difference between various forms of

presentation. We can expect that people who belong to the Hedonist category will give higher values to visual presentation, disregarding the product category. We assume that belonging to the customer category will lead to a preference for some form of presentation.

Another form of research use would be the use of forms used, for example, by the research of consumer perceived value by Amini, Falk, and Schmitt (2014, p. 392). Respondents will get a different expression connected with the type of customer group. They will answer how vital are such expressions by their design perception. At the base of respondents' answers, we can for every respondent create a radar chart. A comparison of the area created inside the radar chart by points related to the customer category should show the preferred respondent type.

Differences among the area by the respondent show differences in the importance of diverse design aspects. Variations among respondents could support the idea of the existence of different consumer classes.

By such a form of quantitative research, we face several problems. The first is the construction of expression, which will represent every category of assumed classification. Such expression must be understandable and related to the expected form of behavior. It should reflect the same period of the decision process and must avoid the imagination of the exact product type. Like the first proposal, we selected the following expressions:

Contestant evaluation of design

I consider design award as a good recommendation

I respect the expert review of product design

Good design product will award different certificates, formal rewards, and recognition

Evaluator perception of design

I need product-related information to evaluate product design

I like to know the designer declaration of design strategy

By every category of a product exist criteria for good design

Hedonist evaluation of design:

When considering a design, I do not look at the opinion of the surroundings

No information is required to assess good design

Good design is something I will like

Fashionist evaluation of design

Companies mainly advertise products with good design

Celebrities like to associate with products that have an exceptional design

Successful are mainly products with good design

That list of statements if opened for discussion and adaptation. After review, we plan to use it in the first research. The results of the first survey will be analyzed and checked. If the result confirms our expectation, we will try to realize the survey in more extensive international environments and get more relevant customer behavior results.

The next problem will be how, through the questionnaire, avoid leading through the statements. One possibility is electronically randomizing statements, which will respondent answer; another alternative is to give expression representing different categories into one question. The best alternative, which combines both methods, would probably have software complications by processing. It would require a questionnaire as a program itself. Such an alternative could be possible in further stages of research.

Another problem which can be technically solved would an area calculation. The question is if the area should be calculated as area of two triangles or as the area of quadrilateral. For the first comparison we can use simplified method of average values to identify differences among respondents.

2.2 Qualitative verification of classification

As we mentioned above, there are several negatives and risks of quantitative research. It requires big samples to get representative results. Even by significant samples, language or cultural environment can have an impact on the representativeness of results. By limited financial funds efficiency of such a survey can be very low.

On the other hand, qualitative methods require a lower mass of people working to achieve reliable results. We are, in a recent moment of research, missing personal sources to use qualitative verification. Qualitative methods require mainly professional knowledge in the field of sociology and psychology, which we are missing recently. Therefore, we expect to use such methods, especially in the second stage of classification approval.

As appropriate, we consider mainly the observation method. Comparing with other qualitative methods, it can follow the real behavior. If we face the quality, environment, or design questions, the respondent can easily anticipate the expected answers, which can have negative impacts on results. Observation is recommended as an appropriate method in case we are looking for observable or hidden details or need to identify group dynamics (MacDonald, Headham, 2008, p. 50). Observation as a method can consist of a mix of techniques, i.e., informal interviews, direct observation, participation in the group's life, collective discussions, analyses of personal documents produced within the group, self-analysis, and life-histories, notes, diaries, or transcripts. The investigator's task is to synthesize all such information (MacDonald, Headham, 2008, p. 50).

Boote and Mathews expect that observation is an appropriate Methodology when at least one of the following four criteria is met (Boote, Mathews, 1999, p.17):

1. the phenomenon under investigation is easily observable
the phenomenon under investigation is a social process or a mass activity
the phenomenon under investigation occurs at a subconscious level
the consumers under investigation are either unable or unwilling to communicate directly with the researcher.

Our situation fulfills all most criteria we mentioned. A reference for some design will be observed through the time spend by the presented product. Using the eye-tracking method, we can get even more accurate information about different available products. Almost all consumers must make a purchase decision on the base of design

perception. The preference for some design and some form of design presentation is subconscious, and consumers very often reject to declare their real opinion about design as they hesitate to be considered as not cultural.

Concerning costs and time sources, we can expect to make such a survey as an experiment only. The following steps could prepare such an experiment.

The choice of appropriate product categories, which will represent different categories of consumer products.

The Selection of appropriate description representing different forms of design perception. Product characteristics will represent the Evaluator category, Awards and achievement will represent contestant, and Product advertisement will represent the Fashionist category of customers.

Every participant in the experiment will evaluate the product after getting complex information. Besides that, the person will be observed by the camera.

Behavior of customers will be analyzed by time spent analyzing the different types of presented information.

We assume the tested person will take more precise information to agree with his/her type of design perception. If participants show significant differences between different types of obtained information, it can support our presumption of different customer categories.

In the moment, such a form of survey is outside our capacities. However, for the future, it can be the right way of classification approval. Additional financial sources and technical capacity will be necessary to realize such a survey.

Conclusion

In our contribution, we developed an alternative approach concerning perception design. Design is considered a subjective product value in marketing literature. A company declares its design attributes without knowing if customers will accept their design. We adapted previously developed customer classification of quality perception on the design perception to get an overview of factor which influence customer perception of quality. Such knowledge should help the company make its marketing communication more efficient. An analysis of existing customers allows a company to win an overview of the focus of loyal customers and sources of competitive advantage. The selection of appropriate marketing communication can decrease the cost of communication and achieve the required segment.

In our work, we are in the first phase of work. The next step would be to confirm the assumption we made by a higher group of respondents representing different social, cultural, and national segments.

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