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THE PERCEPTION OF RESPONDENTS OF PACKAGING INNOVATIONS IN SLOVAKIA

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Abstract: The paper deals with the evaluation of the perception of packaging innovations in terms of their functions through the Kano model. It focuses on the evaluation of the perception of innovation of all main seven functions of packaging, in particular on handling, protective, informative, economic, environmental, promotional and ecological packaging functions. The results indicate that the target groups interested in the new innovative packaging are mostly in age between 41 to 60 years. These groups have the highest requirements for new packaging. The innovations of handling functions of packaging have the most significant influence on the older generation. However, almost all ages categories positively recognize ecological innovations of packaging.
Key words: innovation, packaging, functions of packaging.
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Introduction

Companies should monitor changes in consumers taste when choosing their marketing and packaging. On the other side, companies must also focus on the attention to the new technology of packaging. In the past, there was a change in design about every 15 years, but now due to the market environment, it is much more often. Because of packaging, it is also possible to reveal the relationship of the companies with the environment and nature, for example by determining whether the companies use limited or recycled materials (Pajtinkova-Bartakova, Gubiniova, 2012; Supin, 2009, Palus, 2004). Therefore it is not only important to create packaging but also there is a responsibility of how it can be re-used, i.e. recycling.

By 2030, the European Commission also recommended to increasing the recycling of municipal waste at least to 70% and recycling of packaging waste to 80 %, whereas 90 % is reported for the paper, 80 % for plastics, and 90 % for wood,

metal and glass. The European Commission also recommended banning landfill of biodegradable waste and separate components by 2025. The European Union is ahead of other regions since 1995, and today is responsible for 18% of green innovations worldwide. The biggest share of green innovation in Europe has Germany (half of them). The other important innovators are Japan, USA, South Korea and China.

The aim of the paper is to analyze the perception of innovations of packaging functions by the Kano model in terms of the functions in Slovakia. The similar research focused on packaging challenges and innovations was conducted by Zhang et al. (2016). He studied the issue of innovations in terms of packaging design. Reference framework for the design of product packaging system that can be applied to e-operations was analyzed by Regattieri et al. (2014). They developed the mathematical model of innovative packaging solutions for e -commerce.

1. Literature Review

The package can be understood as a tool or set of tools to protect the products from a potential damage. It allows better handling, facilitates the marketing and consumption of products. The package moves through various stages of marketing and consumption. Accordingly, the package can be divided into three stages which are – transport, sales and consumer package. The transport package has the protective and rationalizing function during handling, storage and transport process. It is used for the transport of foodstuffs in the consumer packaging, for the sales packaging and for the transport of non-prepacked foodstuffs (Zeman, 2005).

Two types of packaging materials are distinguished with a high degree and low-degree of proactive behavior. The auxiliary packaging material is a part of the package. It ensures full functionality of packaging and fulfills specific packaging tasks. For example auxiliary packaging material involves nails, adhesives, labels, corks or caps (Dzurova, 1997 Kacenak 1996; Zeman, 2005).

Many authors define the different division of the packaging functions. The authors Zeman and Kacenak (2001, 1996) divided the packaging function into six key functions: protection, guarantee, rationalization, economic, communication and ecological functions. Dzurova (1997) in her book "Package and Packaging as part of the logistics" lists five functions of packaging based on Schulte (in Dzurova, 1997) namely: protection, storage, transport, handling and information.

Kacenak (2001) and Zeman (2005) later define the functions of packaging as a product protection from potential damage; enabling comfort of handling. Packaging must comply with the transport, storage and must be suitable for the store and prevent stealing; it includes promotional and informational function.

Based on the above-mentioned literature, there are various definitions of packaging functions. For this particular research we used the dividing by Calver (2004) and Loucanova (2014): handling, protective, informative, economic, ecological, promotional and recently often mentioned social function.

At the present time packaging has a great potential to contribute to sustainable development through the functions. However, it is necessary to ensure know-how on how packaging features and properties affect sustainable development among consumers, suppliers, authorities, and the media. Lindh et al. (2016) proposed to establish uniform terminology of packaging functions for better understanding and communication leading to their development and decision-making processes. In the research, they divided the functions according to environmental, social and economic dimension.

The importance of packaging started to increase after the Second World War when the doctrine about packaging evolved from the empiric to the relevant scientific discipline. With the development of this discipline, other branches of science were interconnected, for instant discovery and invention of plastics (Kacenak, 2001).

Plastics are an everyday part of our lives and we are in contact with them almost everywhere. Plastics are lightweight, long-lasting and their production is relatively cheap. One of the most important advantages is the low price of oil. Producers prefer to buy new raw material than to invest in recycling technology. This technology is not able one hundred percent guaranteed the quality. The largest producer of plastic materials is China where 39.5% of plastic production belongs to the production of packaging, 20.1% belongs to the building industry and 8.6% belongs to the car parts and electronic equipment production. The second place in the manufacture of plastic materials belongs to Europe. Association of Plastic Manufacturers "Plastic Europe" presents, that each year over 29% of the plastic waste is recycled in Europe. However, 31% of the plastic waste ends in landfills and more than 39% in incinerators. The level of recycling in the European countries varies. For example, the highest rate of recycling energy appreciation is in countries where the dumping site of plastic products is banned. Plastic Europe also states that Austria appreciates or re-uses up to 98% of plastic packaging. Germany, Netherlands and Sweden indicate similar standards. By contrast, in Slovakia just over 30% of plastic waste is recycled, 20% of waste ends up in incinerators and the rest in landfills (EUROACTIVE, 2016). Recycling of plastic packaging can save resources themselves as well as nature.

At present, recycling has been very popular in Slovakia as well as a solution to this problem since it is more favorable in economic terms and also facilitates their re-utilization. From January 1st 2016 a new Act came into force – Act on Waste No. 79/2015 and on amendments to certain acts. This Act governs programming

documents for the waste management system, waste prevention measures, rights and obligations of legal and natural persons related to waste prevention and waste management, extended producer responsibility, etc. Thus, plastic packaging, which will be in color-coded containers will be re-used or energetically recovered. For instant, an impending fine of up to € 1,500 if a paper is disposed to the glass container. According to the new rules of this legislation, companies will fund the separation of waste and the collection of unseparated waste will remain as inhabitant's costs. This new approach should motivate residents to increase interest in waste separation because the proportion of sorted waste will be higher. The above-mentioned approach will have an influence on the lower ratio of residents reimbursed costs to producers (Alacova, 2015).

2. Methodology

The principal method of the research for the perception of packaging innovations in terms of the functions is a method of the Kano model. The aim of the Kano model is to capture customers' opinion according to the requirements of an observed object (Goodpasture, 2003).

The methodology consisted of several steps:

- compiling questionnaire to individual functions of packaging innovations,
- questionnaire measures for gathering specifiable information,
- evaluation,
- processing the results in a matrix of a typology of perception of packaging innovations in terms of the functions by respondents and subsequent interpretation.

As the first step, it was necessary to compile a questionnaire, which provided concrete questions–statements. The questionnaire consisted of pairs of positively and negatively conceived questions and statements. According to the methodological approach of the model, respondents had an opportunity to respond every question (statement) on a scale from 1 to 5 representing a strong agreement to strong disagreement with that question (statement) based on the draft.

Afterward questionnaire measures were determined. The sample of respondents was set at 120 respondents in Slovakia, keeping the same proportion of respondents for each given age category. The survey was conducted through electronic forms as well as by personal questioning.

In the following analyses, received responses are evaluated according to the cross rule (Table 1). The responses are subsequently evaluated by two-factor analysis based on age categories. Based on the Kano model, the findings were included in the following categories according to how respondents perceived new packaging:

- M – are obligatory requirements that customers consider as normal and are automatically expected. These requirements can be identified as primary or basic and therefore they only deal with customers in the event of non-compliance. Identifying them is an elementary importance mainly because even though their fulfillment is reflected in customers' satisfaction, their deficit and failure is reflected in customers' dissatisfaction as they immediately realize it.
- O – are one-dimensional requirements that are represented by those product attributes that lead to fulfillment and satisfaction in the event of non-compliance to customers dissatisfaction, i.e., the higher the degree of compliance with these requirements, the more satisfied the customers are, but compared to the mandatory requirements customers automatically do not expect them.
- A – are attractive requirements that have a clear impact on customers satisfaction because it is a requirement that customers did not expect.
- R – are contradictory or reverse requirements in some literature.
- I – are requirements which do not have any influence on customers. They are also called irrelevant requirements. This category involves the attributes that are not critical for customers and their pass or fail does not affect their satisfaction or dissatisfaction (Ducar et al. 2006).
- S – are skeptical requirements (Grapentine, 2015).

Table 1. The Kano Model

		Answer to the Dysfunctional Question					
		Like	Acceptable	No feeling	Must-be	Do not like	Other
Answer to the Dysfunctional Question	Like	S	A	A	A	O	
	Acceptable	R	I	I	I	M	
	No feeling	R	I	I	I	M	
	Must-be	R	I	I	I	M	
	Do not like	R	R	R	R	S	
	Other	"Other" responses are ignored					

Legend
O: One-dimensional Evaluation
A: Attractive Evaluation
M: Must-be Evaluation
I: Indifferent Evaluation
R: Reverse Evaluation
S: Skeptical (considered to reflect a mistake)

Source: Grapentine, 2015

As the next step of methodology, typology matrix of consumers' was created. This is modified typology matrix of perception of packaging innovations in terms of their functions in order to better illustrate the matter of packaging innovations and consumer's perception. The matrix describes two factors, on the x-axis are age groups and on the y-axis is innovative status. Innovation status is determined based on the results of the questionnaire as a sum of the identified requirements imposed

on the new packaging by their functions according to the assigned weights as indicated by Loucanova (2015), where: "M" obligatory requirements have weight 3, "A" attractive requirements have weight 2, "O" one-dimensional requirements have weight 1, "I" indifferent requirements or not having an impact have weight 0, "R" contradictory requirements have weight -1, "S" skeptical have weight -2 in different age groups and their sum. The significance of the identified requirements influence for new packaging according to their functions is defined as the weighted average of the identified requirements percentage. The conclusion is made by deduction and induction. To conclude the recommendations and conclusions of the phenomenon of perception of packaging innovations in terms of their functions are made according to the Kano model.

3. Result and discussion

According to collected data, we consider the different attitudes of the respondents consistent with the age. The differences in the perception of the innovation of packaging functions based on the respondents' needs, attitudes, values, expectations, marital status and interests in various categories are significant.

The results summarize collected data to the Kano model typology matrix of the packaging innovations perception in terms of the functions. The Kano model identified the innovative status and the size of an impact of the packaging innovations among the monitored age categories. The innovative status was calculated as the sum of the points that have been allocated to the individual categories of the questionnaire, according to the methodology. The size of the impact was calculated as the sum of multiples of the individual identified categories percentages of the Kano model by the individual weight that prevailed in the age group, table 2.

Subsequently, the analyzed innovative status and size of the innovation impact of packaging in terms of the functions to the individual age groups is described in the cluster of typologies perception of packaging innovations in terms of the functions.

In the first age group (18-30 years) respondents identified only one of the available functions and packages for them as an important innovation in packaging with ecological function. As there is displayed in Figure 1, the Kano model assigned them the lowest innovation status. Due to the large impact on this age group (32), it seems the most appropriate to use for these innovations halo effect. Helus (2015) consider the effect among the mental shortcuts to facilitate cognitive processes in decision-making. This is a guide to automating a particular situation or simplify intuitive decisions when choosing from several options. Consumers decide according to the first impression of innovations.

Table 2. The calculation for the assembly nut typology

Ages	18-30		31-40		41-50		51-60		61+	
Handling function	I	0	R	-1	A	2	O	1	A	2
Protective function	I	0	O	1	O	1	O	1	I	0
Informative function	I	0	I	0	O	1	O	1	I	0
Economic function	I	0	I	0	I	0	O	1	I	0
Ecological function	O	1	O	1	A	2	O	1	I	0
Promotional function	I	0	I	0	I	0	I	0	I	0
Social function	I	0	I	0	I	0	I	0	I	0
Innovation status	18-30		31-40		41-50		51-60		61+	
Handling function	48	0	48	-1	28	2	56	1	48	2
Protective function	52	0	36	1	44	1	32	1	44	0
Informative function	52	0	40	0	36	1	32	1	72	0
Economic function	52	0	48	0	48	0	56	1	25	0
Ecological function	32	1	36	1	40	2	24	1	64	0
Promotional function	60	0	36	0	44	0	56	0	52	0
Social function	68	0	64	0	64	0	48	0	44	0
Size impact	32		8		54		40		96	

Source: authors' computation

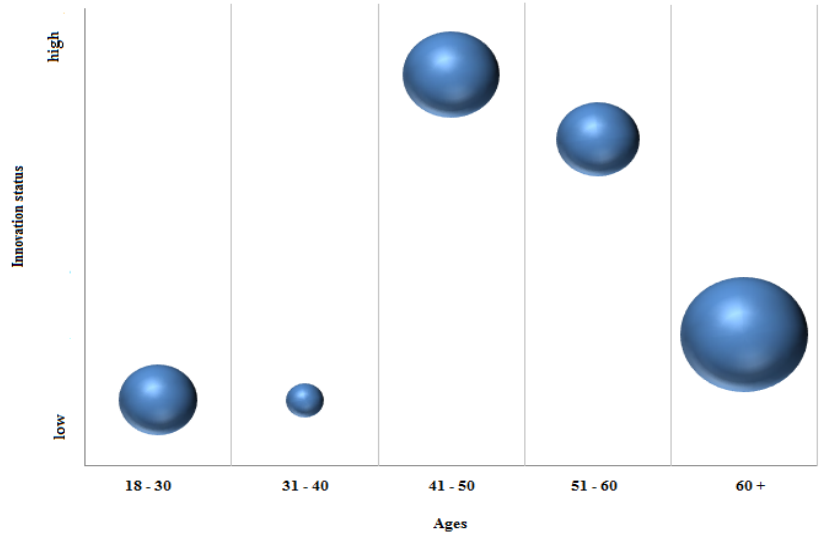

Figure 1 Matrix of typology of perception of packaging innovations in terms of their functions by respondents

Source: authors' computation

In the age group 31-40 years the respondents already know more specifically what is important for them. As we mentioned above, it is associated with the change in the attitudes of people in this age in general. In this age usually people plan the future and family. Most of them identified ecological functions and protective packaging as the most important issue. Therefore companies should mainly focus on innovations of these two functions of packaging with this age group of respondents consider as important. On the other side companies should avoid innovations of handling functions of packaging, which have negative effects on them. Most of the respondents in this age group are not a very sensitive target group for packaging innovations because their low innovation status is influenced mainly by the negative attitude towards handling functions of packaging.

The analysis confirmed that the respondents included in the category of 41-50 years have the specific requirements. They know what they consider important when choosing products and they also recognize what is unnecessary. As the most important factor they chose the protective and informative function of a package. For them the handling and environmental functions are attractive. The above-mentioned age group is the target group for new packaging innovations, given the highest innovation status with the influence size of 54.

Respondents in the category of 51-60 years as well as in the former category know exactly what they specifically require and what they consider unnecessary. In this age category consumers consider important the handling, preservative, informative, economic and environmental functions of packaging. For them these functions are one-dimensional requirements where the higher rate of fulfillment the consumers are more satisfied. However compare with the mandatory requirements, customers do not expect them automatically. With this age group companies should focus on innovations in general functions of packaging and also on the specific innovations of product packaging. It becomes obvious from the high innovative status.

In the last age group same as in the first categories respondents identified only one of the packaging functions as important, namely innovations of handling functions. Therefore, companies should focus on new packaging that would simplify product handling. Although their innovative status is low, simplify product handling has the biggest impact on this target group and often this is the key factor for buying a product. It has a clear effect on the satisfaction of this age category. As Lesakova (2012) mentioned the reason is related to the type of transport because a percentage of people using their own transport to shop with higher age gradually decreases. The respondents in this age group are becoming dependent on assistance when they come to the purchase. According to her research the increasing age is associated with increasing mobility problems of older people.

Based on the results of responses in the various age groups, generally we can

conclude that the majority of respondents agreed that the packaging should be ecological and should meet the informative and protective functions. These three functions can be attributed to innovations that are most preferred among all respondents. Within the innovation policy companies should consider a new packaging act, social responsibility, which will take into account economic efficiency, the environment and impact on society.

In addition to above the paper has both theoretical and practical benefits. Theoretical benefits are at the level of application of the new approach of Matrix typology of perception of innovations by respondents and determining the status of innovation through the Kano model. In terms of practical approach it focuses on information for innovators, what packaging aspects need to be upgraded according to different age categories. This can then be reflected in the performance of companies and their investment decisions as stated Baltes, Dragoe, Ardelean (2014); Ipate, David, Ipate, Bogdan, (2015) and Borlea, Mare, Achim, Puscas (2016).

4. Conclusions

Every company wants to successfully establish itself on the market, but it is up to the company how to reach the aim. One of the possible ways is innovation in packaging, which the paper analyzed. Based on the results of the Kano model, requirements for new packaging in terms of all seven functions of packaging were identified, in particular handling, preservative, informative, economic, environmental, promotional and ecological functions of packaging. The results indicate that the main target group for the new packaging innovations is consumers of age categories from 41 to 60 years. They have the highest requirements for packaging innovation given the highly innovative status. However, almost at all age categories respondents require ecological innovation packaging. The older generation requires mainly innovation of the handling function of packaging, which has a low innovative status but has a very big influence on their purchasing decision with a clear effect.

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