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CONSUMERS' PERCEPTION OF RETRO-INNOVATION OF WOOD PRODUCTS

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ABSTRACT

Consumer satisfaction is one of the main attributes influencing the company success in the market. As consumer satisfaction is not an absolute and objectively measurable value, companies must carry out several activities to ensure its maximum level, which include innovative activities as well. In the context of innovation, we are increasingly confronted with the term of retro-innovation connecting consumers with the periods from the past that are supposed to be nostalgic, interactive and environmental. The application and implementation of retro-innovations supports a positive impact on consumers, employees, communities and the environment, and therefore their use is also appropriate in connection with wood products. The Slovak consumers' perceiving the retro-innovations of wood products is examined in the paper. Main observed requirements were determined through the Kano model in relation to the retro-properties of wood products, which have a significant impact on consumer satisfaction. The results confirm that consumers perceive retro-innovations of wood products positively. From the consumers' point of view, retro-designs in furniture and carpentry products as well as other wood products are attractive and thus have an obvious impact on their satisfaction.

Key words: retro-innovation, eco-innovation, KANO model, wood products, consumers´ perception.

INTRODUCTION

The issue of consumer's satisfaction has a long tradition in business practice. Previously insufficient attention has been given to this issue in the furniture market. One of the oldest references can be found in literature in the 19th century, when concepts such as "targeting the offer", "perceived value" or "consumers´ expectations" are mentioned (DUCÁR *et al.* 2006). This area became the subject of systematic interest of economists in the 1980s, when under the influence of internationalization of the economy, beginning of globalization and generation of innovations, new opportunities began to be sought to increase business competitiveness by satisfying consumer requirements. Consumer satisfaction with the product is not an objective or absolute value. It is important to find new possibilities and innovations, which help the product create needs that the consumers perceive as satisfactory. One of the possibilities to look for and identify variables characterizing consumers´ satisfaction is to monitor the specific properties of products, which can be described by nonlinear and asymmetrical relationship dependence between the importance and satisfaction of consumers with the various features

of representative products. These dependencies are analysed during the individual transaction, alternatively they are based on cumulative satisfaction with the monitored products and services (LOUČANOVÁ *et al.* 2015). The study of OLŠIAKOVÁ *et al.* (2018) describes consumers' satisfaction with wood framed houses by ordering the selected features according to the level of satisfaction.

Nowadays, we often encounter the interpretation of consumer satisfaction, following the theory of contradiction, which we can also apply in the sale of storage furniture. When monitoring the values that represent consumers´ satisfaction with products, it is appropriate to confront them with the characteristics of the product, where there is an experiential feeling of compliance or contradiction with their expectations. The issue of individual values has been studied by several authors, who take into account the theory of different perceptions of product parameters derived from two-factor motivation, while changing the conceptual apparatus for product requirements. CADOTTE and TURGEON (1988) define product requirements as requirements of dissatisfaction, satisfaction, and critical character. On the other hand, BRANDT (1988) evaluates them at several levels and defines minimum requirements, satisfaction-enhancing values and hybrid requirements. Similarly, LLOSA (1997) characterizes the requirements as basic, plus and key ones.

TOMEK *et al.* (2007) describes the processes of creating consumer value, representing an effort of the company to gain consumers and ensure their loyalty. Above all, the company tries to attract and keep attractive consumers that realize relevant sales or ensure a reasonable turnover. Based on the above assumptions, the company concentrates on so-called advantageous market segments and consumers. Appropriate structure of consumers and their number are a significant contribution to the company´s value, which is the future growth guarantee. Consumer satisfaction is defined by MARUCA (2000) as a measure of meeting consumer expectations in relation to product characteristics and provided values, which are not in many cases assessed accurately and objectively.

There are several reasons why it is necessary to focus on monitoring consumer satisfaction, not only at the business but also at the macroeconomic level. At the business level the main reason of the interest is the impact of consumer satisfaction on the company's financial results. At the macroeconomic level, it is a matter of creating a measure for comparing companies (consumer satisfaction indices), which is later applied as a tool of forecasting possible development trends of individual companies. This issue is based on the theory of contradiction, which considers the assumption that consumers have a certain idea of the product characteristics. They confront this idea with the characteristics of the given product, which they obtained by purchasing. At this point, there is a situation in which the consumers feel a match or discrepancy between their experience and their expectations.

PALUŠ (2010) presents that consumer preferences are reflected in consumer markets. They are decisive when buying products and they relate to the material, its quality, appearance, functionality etc. RAMETSTEINER *et al.* (2007) dealt with the issue of attitudes towards wood and wood products. The study aimed at collecting and presenting the results of consumers' views and attitudes towards wood and defined categories of wood products in European countries over the last 10 to 15 years. The results and conclusions of the surveys point to very similar attitudes of consumers in European countries towards some of observed properties of wood products. The preferred features of consumers include design and quality. Consumers appreciate mainly the naturalness of wood and the pleasant atmosphere it creates in the interior design. In the case of wood used outdoors, they appreciate strength, durability and environmental friendliness most of all. Similar conclusions were reached by studies (RAMETSTEINER *et al.* 2007; LOUČANOVÁ *et al.* 2015) pointing to the importance of eco-innovation. In an international context that sometimes involves inherent conflicts among economic progress, limited natural resources, and environmental problems and threats, eco-

innovation has become a central topic between leading researchers and policy makers and it is considered to be a key driver of long-term stable economic development (CHEN *et al.* 2017). There is a strong link between economic and environmental performance (RACHISAN *et al.* 2015, TILINA *et al.* 2016) in the meaning that environmental improvements as a source of innovation can increase marketability while focusing on reducing the negative effects on the use of natural resources and on the quality of the environment through less harmful and more productive methods (ADEDE 1992).

Eco-innovation can be characterized as the creation of a new or modification of an old production process, system, practices or products to reduce or eliminate its environmental impact (ISTRATE *et al.* 2019).

In the case of modification of an old product, production process, system, practices or the products we signify retro-innovations. They present innovations that authentically imitate a product or experience from the past to take the user back to the past, or that use a nostalgic format to meet new needs, alternatively which use a new format to meet old needs are called retro-innovation (LEBERECHT 2013). Within the concept of retro-innovation, products are designed to connect us with ways from the past that are nostalgic, interactive and environmental.

Retro-innovations have a positive impact on consumers, employees, the community as well as the environment.

The concept of retro-innovation is often underestimated, but its importance in the context of sustainable development is indispensable from the point of view of the whole society. Therefore, the aim of this paper is to evaluate the perception of retro-innovation of wood products by Slovak consumers.

MATERIALS AND METHODS

The Kano model was used as a primary method to evaluate the perception of retro-innovations of wood products. It considers theories of contradiction to identify the differentiation variables of the product by creating its unique position on the market. The analysis is primarily focused on finding the values of the product that the consumer considers to be must-be, attractive and one-dimensional. The must-be requirements are significant from the consumer point of view because in the case of their non-compliance they cause his strong dissatisfaction. On the other hand, if they are met, they have little effect on consumer satisfaction. It is a basic product criterion that the consumer requires automatically.

One-dimensional requirements are defined as claims, where we can see a linear dependence between their fulfilment and consumer satisfaction. The more requirements are met, the more satisfied the consumer is. Attractive values include requirements that lead exponentially to an increase in consumer satisfaction. Regarding the above-mentioned information these requirements have the most significant impact on consumer satisfaction. In addition to the above explained requirements, there are also identified reverse, questionable and indifferent requirements not influencing the consumers. Of course, it is not possible to strictly separate individual requirements. They overlap and influence each other at the same time.

The analysis of parameters focused on the examined problem was followed by the methodical procedure to assess the retro-innovation perception of wood products by Slovak consumers, such as:

- retro-materials – the focus was on examining consumers' perceptions and preferences for materials of a traditional nature, such as wood, which is nowadays often replaced by substitute materials,
- retro-technologies – presenting traditional technological processes,

- retro-design – characterizing authentically imitating products or experience from the past to carry the user back to the past, or which represent a nostalgic format to meet new needs or which use a new format to meet old needs and nostalgic view of the traditional design of wood products,
- price – representing the amount that the consumer must waive in order to obtain a good or service, in our case to monitor the respondents´ perception of wood products price,
- quality – researching the compliance of consumer requirements with wood products,
- environmental friendliness - examining the perception of the ecological impact of wood products on the environment,
- retro-design of furniture, buildings, carpentry products and other wood products - we aimed at monitoring the attitudes of respondents towards various types of secondary wood processing products, such as furniture, construction and carpentry products, buildings and other wood products, including toys, musical instruments, etc.

After precisely determined parameters, a questionnaire was formed according to the KANO model needs. The questionnaire creation involved the generation and formulation of two questions for each examined parameter. In the first case, the question was formulated to detect the consumers´ responses whether their requests were met. On the contrary, in the second case, the question was formulated in such a way that the consumers' requests were not met. In some specific cases, instead of formulating questions, the consumers´ reactions to the formulated statements concerning the given parameter were monitored. Consumers had the opportunity to express agreement or disagreement with the question or statement on the Likert scale (1 – like, 5 – dislike).

Then measures for the questionnaire implementation were determined. The questionnaire presents a versatile method for obtaining and gathering information about consumer activities and attitudes.

The sample of respondents was 1515 that fulfils the minimum number of respondents (666), with regard to the sample size calculation, with the average permanent population in Slovakia, gained from the data presented by the Statistical Office of the Slovak Republic (5,452,257 inhabitants in 2019). The sample was calculated at the 99 % confidence level and margin of error 5 %. Respondents at the age 18 years and over, of both genders (52 % women, 48 % men) participated in the survey.

After the actual implementation of the survey by means of a questionnaire, a database of obtained data was created, where the examined parameters for wood products were defined and subsequently assigned a numerical expression of consumer agreement or disagreement with the given question concerning the defined parameter.

For each parameter, the individual answers to the positively and negatively asked question (statement) were evaluated separately using the cross rule of the KANO model (Table 1). By such a determination, individual properties are specified: attractive (A), must-be (M), reverse (R), one-dimensional (O), questionable (Q) or indifferent (I).

Tab. 1 KANO model for evaluation of consumer requirements.

		Answer to the Dysfunctional Question				
		Like	Acceptable	No Feeling	Must-be	Do not like
Answer to the Functional Question	Like	Q	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	Q

Source: Grapentine, 2015; KANO et al., 1984

The identified consumer requirements are divided into groups and redistributed with regard to the proportions of respondents' sample in percentage. The most represented group of requirements characterize the resulting perception of the examined parameter or value.

To generalize and identify the individual dependencies among the examined parameters of wood products in retro design and better knowledge of consumer requirements, the data from the database were evaluated by statistical methods.

The result of the correlation analysis is the coefficient r, which acquires values in the interval from −1 to +1. Minus 1 means an absolute indirect linear dependence, 0 means no dependence, and 1 means an absolute direct linear dependence. In other words: the closer the correlation coefficient is to 0, the weaker the relationship among the examined variables is (not existing). On the contrary, the closer it is to 1 or to −1; the relationship among the variables is stronger.

We interpret the values of the correlation coefficient according to CHRÁSKA (2000), who describes their dependence as follows: 0.9 to 1 (–0.9 to -1) are considered to be very highly dependent, so there is a very strong interdependence among the variables. Values 0.7 to 0.9 (–0.7 to –0,) are highly dependent, from 0.4 to 0.7 (–0.7 to 0.4) are moderately dependent, from 0.2 –0.4 (–0.4 to 0.2) are with low dependence, from 0 to 0.2 (–0.2 to 0.0) the values are considered to be weak (without dependence).

RESULTS AND DISCUSSION

With regard to the above-mentioned methodological procedure the Kano model categorizes individual responses based on a cross-rule into specified categories, where the properties of the examined parameters are determined as attractive, must-be, reverse, one-dimensional, questionable and indifferent (Table 2).

Tab. 2 Specific requirements for retro-innovation of wood products (%).

Parameters	A	O	M	I	R	Q	Category*
Retro-materials	16.37	16.37	4.09	14.79	37.10	11.29	R
Retro-technology	6.01	30.17	21.98	38.68	1.91	1.25	I
Retro-design	66.67	4.09	12.61	6.60	9.37	0.66	A
Price	33.99	14.19	1.85	33.99	4.09	11.88	A,I
Quality	6.01	30.17	38.68	21.98	1.91	1.25	M
Environmental friendliness	15.38	37.10	4.09	17.29	14.79	11.35	O
Retro-design:							
- Furniture	41.19	13.20	2.77	30.83	6.01	6.01	A
- Buildings	2.77	0.00	4.09	50.50	39.93	2.71	I
- Carpentry products	33.99	15.25	1.91	33.00	4.09	11.75	A,I
- Others (toys, musical instruments, etc.)	60.66	5.94	6.01	14.79	11.88	0.73	A

**requirements - attractive (A), must-be (M), reverse (R), one-dimensional (O), questionnable (Q) or indifferent (I).*

Table 2 shows that retro-innovations of wood products are perceived by consumers in Slovakia differently, but mostly positively, because only two examined parameters have no effect on them (retro-technologies and retro-design of buildings). These two parameters are insignificant for Slovak consumers and their fulfilment or non-fulfilment does not affect their satisfaction or dissatisfaction.

Slovak consumers perceive the ecological friendliness of wood products as a one-dimensional requirement. It means the higher the rate of compliance with these requirements is, the more satisfied the consumers are. There is a direct linear relationship between meeting

these requirements and consumer satisfaction. Retro-design, retro design of furniture, construction and carpentry products, other wood products and their price are attractive for Slovak consumers, which means that these examined parameters have an obvious effect on their satisfaction, because these requirements are not expected by them. If they are not fulfilled, it will not result in consumer dissatisfaction.

Quality is a parameter that must be provided automatically (must-be requirements). They can be marked as primary (basic) and therefore consumers deal with them only in case of non-compliance. Their identification is of fundamental importance because their fulfilment will be reflected in consumers´ satisfaction, but their deficit and non-fulfilment will be immediately realized by consumers and they are dissatisfied. Finally, such a situation will be reflected in their maximum dissatisfaction and the product will lose its competitiveness in the market.

Only retro-materials are perceived in reverse way. It means that consumers react in exactly opposite way.

Based on the procedures presented in the methodology, the specific collected requirements need to be generalized. At the same time, the individual dependencies among the identified consumer requirements for the examined parameters of retro-innovations of wood products were analysed. In order to describe the causality among the individual identified properties of investigated parameters of retro-innovations of wood products, a correlation coefficient symmetrically arranged in a correlation matrix is applied (Table 3).

Tab. 3 Correlation matrix of consumer requirements for retro-innovation of wood products.

		Retro-materials	Retro-technology	Retro-design	Price	Quality	Environmental friendliness	Retro-design			
								Furniture	Buildings	Carpentry products	Others (toys, musical instruments,
Retro-materials		1.000									
Retro-technology		–0.019	1.000								
Retro-design		**0.310**	0.043	1.000							
Price		**0.260**	0.001	–0.145	1.000						
Quality		–0.105	0.022	–0.047	**0.340**	1.000					
Environmental friendliness		**0.226**	0.024	–0.024	0.007	0.185	1.000				
Retro-design :	Furniture	–0.079	0.104	**0.208**	0.080	0.154	0.109	1.000			
	Buildings	0.008	0.040	0.051	**–0.205**	–0.044	0.114	0.087	1.000		
	Carpentry products	0.067	-0.080	–0.011	0.164	0.163	0.035	0.022	**0.300**	1.000	
	Others (toys, musical instruments, etc.)	–0.084	–0.090	–0.027	0.026	0.101	0.142	–0.091	0.124	–0.037	1.000

The correlation matrix confirmed the low causality among the monitored parameters of retro-innovation of wood products. The matrix shows a statistically significant relationship among retro-materials and retro-design, price and environmental friendliness. At a certain price, Slovak consumers also demand a certain quality standard, while the correlation coefficient with the dependence of these two variables shows the highest value

of 0.340. Consumers associate retro-design mainly with furniture. There is a relationship between the design of buildings and carpentry products. The negative dependence is reflected between the price and design of buildings. There is no significant dependence among other examined parameters.

The results of this paper show that retro-innovations of wood products are perceived positively by consumers. They focus mainly on retro-design in furniture and carpentry products as well as in other wood products. These are attractive to them and have an obvious effect on consumer satisfaction. In this context, our results correlate with the results of the study by CURRAJ (2018), where he argues that retro-design in furniture is of high interest in the market economy. Local involved persons, businesses and academia should create and use furniture and its components in nostalgia and retro-design.

However, in terms of materials, consumers prefer modern design of wood materials to classic design. Preferences for furniture styles (retro style inculding) were also a part of investigation in the studies of JOST *et al*. (2020) and KAPUTA *et al*. (2018). A study by ZHU (2020) presents that wood products are an important element in people's lives, because wood products made of specific materials (their combinations and innovative forms of wood as a material) will instantly create a kind of the feeling of what can be a sense of security or other "feelings" that can calm the heart and create “material emotion”. The essence of material emotion is the specific expression of human emotion, but in the process of exploration, we need to use different materials as the media to release it, and then make the heart produce a sense of pleasure. This kind of emotion seems invisible and untraceable, but it exists in every link of life. Therefore, under the guidance of material emotion, design and specific materials in wood products can provide more wonderful details of life and make life more wonderful.

Several studies (JONSSON 2006, RAMETSTEINER *et al.* 2007, PALUŠ 2012, ŠUPÍN 2014, KAPUTA *et al.* 2010;) found out that consumers prefer wood products to its substitutes. Those products of wood have a special position in preferences of consumers, especially for its environmental friendliness, environment suitability, renewability and naturality as well as tradition and health and safety features. This is caused by the wood material itself (PALUŠ *et al.* 2012). In comparison with the previous period, price is no longer a relevant parameter of the consumer behaviour. Consumers focus on a product quality and in proportion to the price they require the quality (correlation coefficient 0.340) as it is also confirmed by RAMETSTEINER *et al.* (2007). Price as a decisive factor in the case of negative dependence was reflected in the retro-design of buildings (the higher the prices, the lower interest in this type of buildings).

Another reason rests in a fact that it represents a significantly higher investment than the other examined type of wood products and that Slovak consumers prefer brick buildings to buildings made of wood (LOUČANOVÁ, OLŠIAKOVÁ 2020), because as it is mentioned by TOIVONEN (2012), the main target group for wood buildings are people with strong environmental values and a willingness to buy and pay a higher price for such products (HANSMANN *et al.* 2006; O'BRIEN and TEISL 2004).

CONCLUSION

The retro-innovation through knowledge and practices change the value of items from daily and old-fashioned to unique and desirable. In this value creation process, retro-innovations represent the connection of the past with the present and the dedication of the cultural heritage and traditions of the forestry and wood-processing industry to future generations, which represents a renewable wealth in Slovakia. Based on the results of the research, we can suppose that Slovak consumers perceive retro-innovations of wood

products as attractive and the individual examined parameters of retro-innovations of wood products lead to consumer satisfaction and they consider them to be natural. These results show that the use of retro-elements and their design in wood products are desirable part of Slovak consumers and therefore it is appropriate to incorporate them into the product portfolios of businesses offering wood products on the market. They should consider the identified requirements of consumers connected with this kind of products.

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