

PERCEPTION OF SUPPLIED FURNITURE AND ITS INNOVATION BY SLOVAK CUSTOMERS

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ABSTRACT

The paper deals with the perception of the supplied furniture and its innovation by Slovak customers. The Kano model as the primary method for identifying the preferences in furniture purchase by Slovak customers is used. The expectations and demands of customers for furniture utility are defined by this model and the specific product characteristics regarding the customer requirements are identified. Quality and design are mandatory requirements in the case of furniture, and the fulfilment of ergonomic furniture parameters and providing the related services belong to attractive ones. Intelligent furniture solutions and the provision of innovative services for customers (e.g., servitization) are adapting furniture innovations on the Slovak market, which represents an equally great potential for furniture retailers when customers attract. These results can be an important impetus for companies to create furniture sales strategies and identify trends for the subsequent adoption of improvements and innovations of selected services and products to meet customer requirements.

Key words: furniture, innovation, KANO model

INTRODUCTION

The aim of innovation is to improve the company's performance by achieving the competitive advantage or maintaining the achieved competitiveness by shifting the demand curve of the company's products. However, low and medium technology industries, including furniture industry, are generally characterized by incremental innovation and adaption. Under such circumstances, innovation activities are rather focused on production efficiency, product difference and marketing. Moreover, finance can be another problem, which determines innovation activities in small and medium enterprises in the furniture sector (ANON 2005).

In the furniture industry, the technological and market turbulences are not supposed to be the critical variables that explain the differences in the companies' innovation performance. This is explained by the assumption that market and technological turbulence is rather low across the sector, and there are no significant differences in consumers' requirements in various countries. In particular, the technological field presents fixed standards, and consumers have quite similar demands, which are not subject to particularly radical changes. In fact, we can expect that in the furniture industry, innovations are not very radical, and all companies undertake incremental innovations. This could also imply that this

sector shows a tendency to innovate based only on its market orientation, and not on its internal tendency to develop technology, probably because it is a traditional, “low-tech” sector (O’REGAN and GHOBIDIAN 2005).

The furniture industry is understood as a low-tech sector where innovation is rather based on the adoption than the invention. This is caused by the shortage of resources in the companies to develop radical innovations, which in any case they cannot protect, because counterfeiting is easy. In general, markets do not appreciate or value radical innovative efforts from the firms, therefore they are not willing to pay an extra cost to make them profitable either. Another important characteristic of the furniture industry is its lack of globalisation (OTERO-NEIRA *et al.* 2009).

MATERIALS AND METHODS

The Kano model was used as a primary method to evaluate the innovation perception of Slovak consumers concerning the furniture. 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 findings what consumers consider to be mandatory, attractive, and one-dimensional.

The mandatory requirements are significant from the consumer point of view because in the case of their non-compliance they cause 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 as they overlap and influence each other at the same time (LOUČANOVÁ 2021, LOUČANOVÁ and OLŠIAKOVÁ 2020).

The analysis of parameters focused on the examined problem was followed by the methodical procedure to assess the services innovation in furniture by Slovak consumers, such as:

- Price – representing a monetary expression of the good or service value.
- Ergonomics – represents furniture that has a positive impact on the customer's comfort when using furniture and its surroundings, including other users of the space.
- Quality - representing the sum of the characteristics, the condition, the nature of the object meeting certain standards.
- Design – representing natural or intentional surface patterns of utility objects.
- Material – represents the substance or summary of individual products serving for a particular further use or processing.
- Services – are the intangible result of a particular economic activity aimed at meeting human needs.
- Innovation furniture: (where innovation means any quantitative or quality purposeful change) with a focus on:
 - Remote control – understood as an electronic device, as additional furnishings to furniture used for its remote control.

- Intelligent solution – a smart module that can replace multiple pieces of furniture.
- Magnetic closure – representing components for furniture which serve to tightly close the opening parts of furniture with the possible use of a magnetic key.
- Backlight – representing several types of light source within the furniture regarding the purpose but also the function that the light will perform.
- Levitation – under this type of furniture we mean the floating furniture, where it is not only a real levitation of furniture, but it is an optical delusion, i.e. the supporting point of the furniture is made of transparent material.
- Services – services for furniture can include one or several of the following elements: Design for durability (to reduce the environmental impacts of furniture consumption); Maintenance and repair services; Reuse of furniture parts; Remanufacturing of used furniture; Servitization - leasing or renting to furniture (BESCH 2005, WILKHAHN 2012, GRZEGORZEWSKA *et al.* 2021, SLABEJOVÁ *et al.* 2019, KOTLER *et al.* 2015, LOUČANOVÁ *et al.* 2021, FARKAŠOVÁ and BAĐURA 2021, FARKAŠOVÁ and PETRÁNSKY 2020).

After precisely determined parameters, a questionnaire was developed incorporating the KANO model needs. The questionnaire creation involved the generation and formulation of two questions for each examined parameter. In the first step, the question was formulated to detect the consumers' responses on whether their requests were met. On the contrary, in the second step, the question was formulated in a way that the consumers' requests were not met. 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 sample consisted of 408 respondents, which meets the minimum sample of 400 respondents, with the required confidence interval of 95 %, accessible error range of 5 %. The evaluation of the obtained data was carried out by the KANO model categorizing individual responses on the basis of a cross-rule into specified categories, where the properties of furniture are determined as attractive, mandatory, reverse, one-dimensional, and indifferent ones. Table 1 outlines the sample's descriptive statistics. The survey was dominantly completed by women (70.34 % of all responses). Some 36.27 % of participants were from 18 to 30 years old, 30.39 % of the participants were from 31 to 50 years old, 15.20 % of the participants were from 51 to 60 years old and 18.14 % of the participants were over 61 years old.

Tab. 1 Descriptive statistics of the sample.

Factor <i>n=408</i>	Specification	Multiplicity	
		Absolute	Relative
Age	18–30	148	36.27
	31–50	124	30.39
	51 -60	62	15.20
	61 and more	74	18.14
Gender	Female	287	70.34
	Male	121	29.66

After carrying out the survey using a questionnaire, a database of obtained data was created, where the examined parameters for innovation in services in furniture were defined and subsequently a numerical expression of consumer agreement or disagreement with the given question concerning the defined parameter was assigned.

For each parameter, the individual answers to the positively and negatively asked questions (statements) were evaluated separately using the cross rule of the KANO model (Table 2). By such a determination, individual properties can be specified as follows: attractive (A), mandatory (M), reverse (R), one-dimensional (O), questionable (Q) or indifferent (I).

Tab. 2 KANO model for evaluation of consumer requirements.

		Answer to the Dysfunctional Question				
		Like	Acceptable	No Feeling	Mandatory	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
	Mandatory	R	I	I	I	M
	Do not like	R	R	R	R	Q

Source: GRAPENTINE 2015, LOUČANOVÁ 2021, LOUČANOVÁ and OLŠIAKOVÁ 2020

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

The derived individual categorizations can be utilized further by aggregating them across all respondents using the customer satisfaction and customer dissatisfaction indices (BERGER *et al.* 1993, SHANIN *et al.* 2013, BEIER *et al.* 2020):

$$\text{Consumer satisfaction (CS)} = \frac{(\#A+\#O)}{(\#A+\#O+\#M+\#I)} \quad (1)$$

$$\text{Consumer dissatisfaction (SDS)} = \frac{(\#O+\#M)}{(\#A+\#O+\#M+\#I)} \cdot -1 \quad (2)$$

with #A, #I, #M, and #O being the categorization frequencies, it means the number of respondents who classified the supply as attractive, indifferent, mandatory, or one-dimensional.

The indices reflect the proportion of respondents for whom the existence/absence of a certain attribute influences customer satisfaction/dissatisfaction. Additionally, consumer dissatisfaction has a minus sign to emphasize the negative effects on customer satisfaction (for historical reasons). For each supply, the satisfaction index is within the range of [0, 1] and for customer dissatisfaction within [-1, 0]. A value close to 1 of consumer satisfaction indicates a high proportion of customers among whom satisfaction can be generated, and a value close to -1 indicates a high proportion of respondents among whom dissatisfaction can be generated. The scale mean of 0.5 for consumer satisfaction (or -0.5 for consumer dissatisfaction) indicates whether the majority of respondents can be positively (or negatively) stimulated, yielding a two-dimensional grid with four quadrants to table 3.

Tab. 3 The division of the features into groups.

Quadrants	Ratio between	Customer satisfaction
Attractive supply	$0.5 \leq CS \leq 1$ and $0 \geq CDS > -0.5$	Attractive values include requirements that lead exponentially to an increase in consumer satisfaction.

Indifferent supply	$0 \leq CS < 0.5$ and $0 \geq CDS > -0.5$	Indifferent requirements not influencing the consumers satisfaction and dissatisfaction.
Mandatory supply	$0 \leq CS < 0.5$ and $-0.5 \geq CDS \geq -1$	The mandatory requirements are significant from the consumer point of view because in the case of their non-compliance they cause his strong dissatisfaction.
One-dimensional supply	$0.5 \leq CS \leq 1$ and $-0.5 \geq CDS \geq -1$	The more requirements are met, the more satisfied the consumer is.

RESULT AND DISCUSSION

Based on the above-described methodological procedure, in the first step the monitored quantities (requirements) of customers were identified when purchasing the furniture. The answers to these questions are a summary of the requirements for furniture purchase and furniture innovations on the market. The following requirements have been identified for furniture: price, delivery, assembly, ergonomics, product quality, design, material, services and furniture innovations (e.g. remote control, intelligent furniture solutions, magnetic closing, backlighting or levitating furniture or levitating furniture accessories).

Table 4 shows that when buying furniture, customers consider quality (38.48 %) and design (66.67 %) to be the main requirements that furniture shall meet. Ergonomics (41.18 %) and services (32.6 %) are attractive for respondents. These requirements, such as ergonomics, quality, design and service, are considered by respondents to be the basic criteria for their purchasing decisions. Other requirements, such as price, material and furniture innovation, do not affect respondents' purchasing decisions. It means they have no significant effect on their satisfaction or dissatisfaction. The price of furniture does not affect their purchasing decisions (50.49 %), but it should be noted that 39.95 % of respondents are influenced by the price in the opposite way, which means that if their requirements are not met, it is perceived in a contradictory way.

Materials generally do not influence respondents as well as the price. It is also worth mentioning that for 25.5 % of respondents the used material is perceived as an attractive requirement. It means that if the material requirements are met, customers are very satisfied, even if they do not primarily expect it.

With respect to the furniture innovations, we also generally observed an indifferent influence on respondents' purchasing decisions and subsequently most respondents perceive them in a reverse way. However, in the case of intelligent furniture solution, 25.5 % of respondents perceive this innovation as an attractive one, which means that they do not expect it, but if this requirement is met, the customer is satisfied.

This is similar with the service innovations, which are attractive for 23.28 % of respondents. Therefore, it is necessary for furniture retailers to focus mainly on meeting the elementary requirements, such as identified quality and design, and subsequently take advantage of the attractiveness of ergonomics and customer service. Intelligent furniture solutions and provided innovative services appear to be adapting furniture innovations on the Slovak market, which represents an equally great potential for furniture retailers in terms of attracting customers.

Tab. 4 Perception of furniture requirements and its innovations.

Properties <i>n=408</i>		A		O		M		I		R		Q		Consumer satisfaction	Consumer dissatisfaction	Categories*
		multiplicity		multiplicity		multiplicity		multiplicity		multiplicity		multiplicity				
		relative	absolute	relative	absolute	Relative	absolute	relative	absolute	relative	absolute	relative	absolute			
Price		2.70	11	0.00	0	4.17	17	50.49	206	39.95	163	2.70	11	0.04701	-0.07265	I
Ergonomics		41.18	168	13.24	54	2.94	12	30.88	126	6.13	25	5.64	23	0.61667	-0.18333	A
Quality		5.88	24	30.39	124	38.48	157	22.06	90	1.96	8	1.23	5	0.37468	-0.71139	M
Design		12.50	51	3.92	16	66.67	272	6.62	27	9.31	38	0.98	4	0.18306	-0.78689	M
Material		25.50	104	3.43	14	3.67	15	64.21	262	1.72	7	1.47	6	0.29883	-0.07334	I
Services		32.60	133	24.75	101	4.17	17	22.06	90	5.88	24	10.54	43	0.68622	-0.34604	A
innovation to furniture	remote control	5.15	21	1.96	8	0.24	1	54.66	223	35.30	144	2.69	8	0.11466	-0.03548	I
	intelligent solution	25.25	103	3.19	13	4.66	19	44.61	182	11.52	47	10.77	13	0.36598	-0.10102	I
	magnetic closure	4.41	18	1.23	5	4.17	17	73.77	301	12.75	52	3.67	5	0.06748	-0.06461	I
	backlight	5.64	23	3.68	15	3.92	16	71.10	290	12.75	52	2.91	15	0.11051	-0.09011	I
	levitation	3.92	16	2.21	9	2.94	12	78.90	322	10.67	44	1.36	9	0.06968	-0.05854	I
	services	23.28	95	20.59	84	18.14	74	31.37	128	4.90	20	1.72	7	0.46982	-0.41470	I

*requirement - attractive (A), mandatory (M), reverse (R), one-dimensional (O), questionable (Q) or indifferent (I)

Figure 1 summarises the previous findings graphically. The parameters represented by individual examined properties of furniture and their innovations are positioned with respect to their customer satisfaction and dissatisfaction values. These four quadrants visualize the respondents' majorities divided into mandatory, one-dimensional, attractive and indifferent requirement categories.

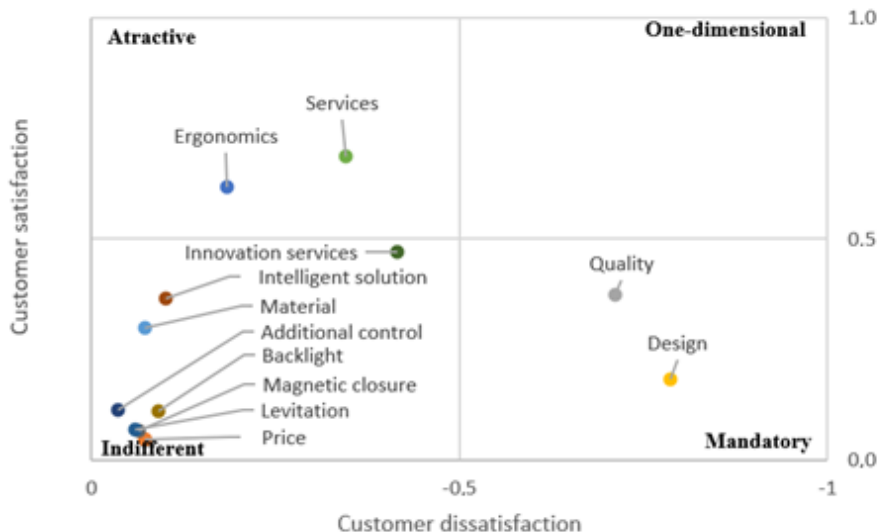


Fig. 1 View of the overall assessment of furniture.

The results of this paper show the consumers' behaviour regarding the supplied furniture. They mainly focus on quality and design, which represents their greatest satisfaction but also the greatest dissatisfaction in case when their requirements have not been met. The parameters of ergonomics and services present attractive requirements resulting in consumers' satisfaction. The parameter of the material showed minimal changes in consumer behaviour. This may be caused by wood material itself, which is preferred to substitute materials for processing furniture (PALUŠ *et al.* 2012). Price is no longer an important parameter in consumer behaviour of customers compared to the previous period. Results also confirm the focus of consumers on quality, as stated by e.g. RAMETSTEINER *et al.* (2007), who presents similar attitudes of consumers towards the listed categories of wood products and describes the differences in preferred properties such as design and quality. It also points out the wood competitiveness as a material regarding its features. Wood is a resource that Slovakia disposes, and it also represents renewable wealth that follows the tradition of wood processing industry in the country. In cooperation with forestry, it creates a chain of traditional industries in Slovakia (PAROBEK *et al.* 2014, 2016; OLŠIAKOVÁ *et al.* 2016).

CONCLUSIONS

The paper is focused on examining the perception of furniture and its innovations in the market in terms of specifying requirements for selected aspects of purchasing behaviour of Slovak customers buying furniture, which is important to know in order to meet the needs and wishes of the customers. Based on our findings, it is important to aim at the quality and design of furniture and then on the ergonomics of furniture and provided services that are attractive to customers. Innovation itself does not currently have a significant impact on

customers' purchasing behaviour. On the other hand, innovations related to intelligent furniture solutions and provided innovative services are very attractive for a certain group of customers. For this reason, furniture retailers should pay particular attention to these aspects of purchasing behaviour of Slovak customers and do not underestimate them when creating a marketing strategy.

REFERENCES

- ANON. 2005. Oslo Manual – Guidelines for Collecting and Interpreting Innovation Data. OECD Publication, Paris.
- BAIER, D., RAUSCH, T. M., WAGNER, T. F. 2020. The drivers of sustainable apparel and sportswear consumption: A segmented kano perspective. In *Sustainability* 12, 2788.
- BERGER, C., BLAETH, R., BOGER, D., BOLSTER, C., BURCHILL, G., DUMOUCHEL, W., POULIOT, F., RICHTER, R., RUBINOFF, A., SHEN, D. et al. 1993. Kano's methods for understanding customer-defined quality. In *Cent. Qual. Manag. J.* 2, 3–36.
- BESCH, K. 2005. Product-service systems for office furniture: barriers and opportunities on the European market. In *Journal of Cleaner Production*, 13, 1083-1094.
- FARKAŠOVÁ, E., BAĐURA, R. 2021. Understandings of design in circumstances of humanity. In *Acta Facultatis Xylogologiae Zvolen*, 63(1), 143-150.
- FARKAŠOVÁ, E., PETRÁNSKY, Ľ. 2020. Design teória a metodológia 1. Technická univerzita vo Zvolene, Zvolen.
- GRAPENTINE, T. 2015. Why the Kano model wears no clothes. [WWW Document]. *Quirks Marketing Research Media*, 34. URL: <http://www.quirks.com/articles/2015/20150407.aspx>.
- GRZEGORZEWSKA, E., SEDLIAČIKOVÁ, M., KALAFÚS, J. 2021. A comparison of the importance of the furniture manufacturing in EU countries using cluster analysis and Hellwig's method. In *Acta Facultatis Xylogologiae Zvolen* 63, 151-164.
- KOTLER, P., BURTON, S., DEANS, K., BROWN, L., ARMSTRONG, G. 2015. *Marketing*. Pearson Higher Education, AU.
- LOUČANOVÁ, E., KALAMÁROVÁ, M., PAROBEK, J. 2015. Konkurencieschopnosť produktov dreva z pohľadu použitého materiálu. In *Acta Facultatis Xylogologiae Zvolen* 57, 155-163.
- LOUČANOVÁ, E., OLŠIAKOVÁ, M. 2020. Identification of customers' drivers for the wood building as an ecological innovation in building construction in Slovakia. In *Acta Facultatis Xylogologiae Zvolen* 62, 177-188.
- LOUČANOVÁ, E. 2021. Perception of Zero Waste in the Context to Environmental Innovation in Slovakia. In *Studia Universitatis Vasile Goldiș, Arad-Seria Științe Economice* 31, 22-33.
- LOUČANOVÁ, E., ŠUPÍN, M., ČOREJOVÁ, T., REPKOVÁ-ŠTOFKOVÁ, K., ŠUPÍNOVÁ, M., ŠTOFKOVÁ, Z., OLŠIAKOVÁ, M. 2021. Sustainability and branding: An integrated perspective of eco-innovation and brand. In *Sustainability* 13, 732.
- OLŠIAKOVÁ, M., LOUČANOVÁ, E., PALUŠ, H. 2016. Monitoring changes in consumer requirements for wood products in terms of consumer behavior. In *Acta Facultatis Xylogologiae Zvolen res Publica Slovaca*, 58, 137.
- O'REGAN, N., GHOBIDIAN, A. 2005. Strategic planning: a comparison of high and low technology manufacturing small firms. In *Technovation* 25, 1107-1117.
- OTERO-NEIRA, C., TAPIO LINDMAN, M., Fernández, M. J. 2009. Innovation and performance in SME furniture industries. In *Marketing Intelligence & Planning*, 27, 216–232.
- PALUŠ, H., MAĐOVÁ H., KAPUTA, V. 2012. Consumer preferences for joinery products and furniture in Slovakia and Poland. In *Acta Facultatis Xylogologiae Zvolen* 54, 123-132.
- PAROBEK, J., PALUŠ, H., KAPUTA, V., ŠUPÍN, M. 2014. Analysis of wood flows in Slovakia. In *BioResources* 9, 6453-6462.
- PAROBEK, J., PALUŠ, H., KALAMAROVA, M., LOUČANOVÁ, E., KRIŽANOVÁ, A., REPKOVÁ ŠTOFKOVÁ, K. 2016. Comparative analysis of wood and semi-finished wood product trade of Slovakia and its Central European trading partners. In *Drewno* 59, 183-194.
- RAMETSTEINER, E., OBERWIMMER, R., GSCHWANDTL, I. 2007. Europeans and wood: What do Europeans think about wood and its uses? A review of consumer and business surveys in Europe.

[WWW Document] Warsaw: Ministerial Conference on the Protection of Forests in Europe, Liaison Unit Warsaw. URL: <http://www.foresteurope.org/filestore/foresteurope/Publications/Eur_Wood_net.pdf> , ISBN 978-83-926647-0-3.

SHAHIN, A.; POURHAMIDI, M.; ANTONY, J.; HYUN PARK, S. 2019. Typology of Kano models: A critical review of literature and proposition of a revised model. In *Int. J. Qual. Reliab. Manag.* 30, 341–358.

SLABEJOVÁ, G., VIDHOLDOVÁ, Z., ŠMIDRIAKOVÁ, M. 2019. Surface finishes for thermally modified beech wood. In *Acta Facultatis Xylologiae*, 61, 41-50.

WILKHAHN, 2012. Environmental Statement. Wilkening + Hahne GmbH+Co. KG, Bad Münden.

ACKNOWLEDGEMENTS

The authors would like to thank the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic and the Slovak Academy of Sciences, grant number 1/0475/22 “Environmental Consumer and Environmental Citizen”, grant number 1/0495/22, “Sustainability of Value Supply Chains and its Impact on the Competitiveness of Companies in the Forest and Forest-Based Sectors” and grant number 1/0494/22 “Comparative Advantages of the Wood Based Sector under the Growing Influence of the Green Economy Principles”. This publication is the result of the project implementation: Progressive research of performance properties of wood-based materials and products (LignoPro), ITMS: 313011T720 (10%) supported by the Operational Programme Integrated Infrastructure (OPII) funded by the ERDF.

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