CUSTOMER ATTRIBUTES IMPACT ON PERCEIVED QUALITY OF CHILDREN'S FURNITURE - KANO MODEL

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Abstract: The paper presents the use of the Kano model and the questionnaire contained in it to analyze customer preferences in relation to children's furniture - a travel cot. A representative group of 30 people was created. The survey showed which attributes of the travel cot were assessed by the respondents as must-have, one-dimensional, and which are excitement attributes (delighters) and mistakes for them. The study will help design a new travel cot model according to expectations of customers - future parents and parents of young children.

Keywords: quality, new product, Kano model, children's furniture, travel cot

1. INTRODUCTION

In the design of new products and services, each enterprise tries to best understand the needs and requirements of customers and create the product or service that customers expect and will be satisfied with. Therefore, in the context of quality, companies should distinguish between the terms 'perceived quality' and 'technical quality'. The quality of the product or service that customers perceive doesn't have much in common with technical quality, because it depends on many external factors, such as customer expectations, advertising or the competition's offer.

To create a product or service best suited to customer needs, enterprises can use one of the quality management methods - the QFD method (Ćwiklicki, 2017, Jagusiak-Kocik, 2019, Tan, et al., 1999), which translates customer requirements into technical language. In addition, to analyze the relationship between the level of customer satisfaction and the quality offered, it may be helpful to use the Kano model, which will be used as a research instrument in the work.

One of the industries that is dynamically developing in Poland is the children's furniture industry. There are many companies on the market that offer future parents and parents furniture in many color variants and in many designs. More and more customers support Polish brands, focusing on quality and safety. However, it is necessary to remember about the Chinese market, which is flooding the Polish market with new solutions and often offering an attractive price. In this situation, Polish manufacturers should focus on closer monitoring of customer needs and design and producing products that meet these needs as much as possible.

The aim of the work is to try to apply the Kano model to a selected type of children's furniture and check how this model will examine the relationship between perceived quality and technical quality in relation to the children's furniture industry.

2. METHODOLGY OF RESEARCH

The Kano model was developed in the 1980s by Noriaki Kano, a quality management theorist (Brajer-Marczak, 2015, Ingaldi, 2016, Ingaldi, et al., 2018, Kuo, 2004, Luor, et al. 2015, Meng, 2018, Tan, et al., 1999) According to this model, product attributes are divided into 4 groups (Wolniak and Skotnicka, 2008):

- the first of the groups are must-have attributes (mandatory). Their presence requires the customer, if the product does not have such an attribute, it causes customer dissatisfaction, while if the product has such an attribute, it does not affect the level of customer satisfaction. The customer considers such attributes to obvious and often asked about the product and its attributes, he does not even mention them,
- another group of attributes are the attributes that the customer is looking for and if they are in the product he will be satisfied. These are one-dimensional attributes that are easy to determine, because the customer is aware of their existence,
- excitement attributes (delighters) - for this group of attributes, the customer will be very happy to have them in the product, because he did not expect them. Excitement attributes greatly increase customer satisfaction, while their absence will not reduce customer satisfaction, because often the customer is not aware of their existence,
- the last group of attributes are mistakes. They are not considered relevant. When creating a product with such an attribute, the producer expected it to be well received by the customer, but such an attribute turned out to be unnecessary and has no impact on the level of customer satisfaction.

Customer research in the Kano model (Rashid, 2010, Wiśniewska, 2009), is carried out through an appropriate questionnaire that examines customer response to two variants: positive (the product has the given attribute and functions properly) and negative (the given attribute does not appear in the product or does not function satisfactory). Such a questionnaire contains for each variant such statements as: "like it" "expect it", "don't care", "live with" and "dislike" The result of the questionnaire is a combination of two answers, each answer can have five values, which gives a total of 25 variants of their combination. Definition of the type of attribute in the Kano model is presented in Table 1 (Wolniak and Skotnicka, 2008, https://sapioresearch.com/kano-analysis). After categorizing all the attributes, it can proceed to the preliminary design work on a new product that will meet certain requirements (Szeliga-Kowalczyk, Łabaza, 2016, Madzik, 2018).

It should be noted that the Kano model is dynamic, because the needs of customers are changing, and the nature of a given attribute is not accepted forever (Ulewicz, 2016).

Table 1
Determination of the type of attribute in the Kano model

Positive		Negative				
		1. like it	2. expect it	3. don't care	4. live with	5. dislike
	1.like it	Q	A	A	A	O
	2.expect it	R	Q	I	I	M
	3.don't care	R	I	I	I	M
	4.live with	R	I	I	Q	M
	5.dislike	R	R	R	R	Q

Where: A - excitement attributes (delighters), O - one-dimensional attributes, M - must-have attributes, I - customer does not show preferences for a given attribute, R - the customer does not want the attribute, Q - contradiction, the client wants the attribute was and was not there
Source: Study based on (Wolniak, Skotnicka, 2008).

At the work an attempt was taken to use the Kano model in relation to one of the children's furniture used primarily by babies and children up to 3 years old - a travel cot, which is shown on Figure 1.

Fig. 1. An exemplary model of a travel cot
Source: own study

The travel cot is light and easily and quickly folds and unfolds. It can be taken on a journey, parents do not have to worry about choosing the place they have in its offer such a cot, in addition, the child even in a different place than the house has the comfort of sleeping in his bed. In addition, such a cot can be used as a playpen.

The cot is made of a frame, which is usually made of steel, the sides are trimmed with a durable mesh that protects the child from falling out and bumps, in addition parents have the opportunity to observe the child. The basic equipment of the cot is a thin mattress. There is also often a side entrance to the cot with a zip, which can be used by older children.

Additional equipment of the cot includes skids, thanks to which the cot can be turned into a cradle and the mattress height adjustment function (at the highest level, the mattress is designed for the youngest children, while when the child begins to stand up, the mattress moves to the lowest level so that the child does not fall out). Often, the cot is equipped with additional pockets for small items, a changing table, mosquito net, canopy, and even a small device with the function of vibration, sounds and light.

3. CASE STUDY – KANO MODEL

Analysis of customer attributes and their impact on the perceived quality of the product were carried out in a medium-sized enterprise dealing in the production of children's furniture, including travel cots. This company, after a preliminary analysis of the market and the needs of customers (also regular customers) decided to design a new, improved model of a travel cot. A survey was conducted among 150 clients (parents of infants to 1 year of age and future parents, women and men, age from 23 to 37). The purpose of this study was to extract the most important attributes for the designed product. After selecting the population of 150 clients, collective lists were drawn up (3 groups of 50 people). 10 people were drawn from each of these groups. The result was the creation of a representative group of 30 people. This group was supposed to list the most important, according to them, attributes for the designed travel cot. Among the many listed attributes, 15 most frequently repeated respondents were selected for further analysis. These attributes are presented below:

1. cradle function (skids included in the set),
2. a mesh of non-soiling material,
3. equipped with a thicker, stiffer mattress,
4. wheels which simplify movement of the cot,
5. two-level mattress level adjustment,
6. large selection of color variants,
7. large, stable changing table in basic equipment,
8. easy cleaning of the upper parts of the cot (protecting the upper metal parts of the cot),
9. a music box in the basic equipment,
10. removable canopy,
11. carousel in basic equipment,
12. maximum load up to 20 kg,
13. system of protection against accidental folding,
14. handles for learning to stand up,
15. quick folding method.

After extracting the most important attributes according to respondents, a survey was conducted using the Kano questionnaire. Part of this questionnaire is presented in the table 2.

Table 2
Part of the Kano questionnaire regarding the travel cot

1. Should the travel cot have a cradle function (skids included in the set)? a) like it b) expect it c) don't care d) live with e) dislike	1. If the travel cot does not have a cradle function (skids included in the set)? a) like it b) expect it c) don't care d) live with e) dislike
2. Should the travel cot have a mesh made of non-soiling material? a) like it b) expect it c) don't care d) live with e) dislike	2. If the travel cot does not have a mesh made of non-soiling material? a) like it b) expect it c) don't care d) live with e) dislike
…	…
14. Should the travel cot have a handles for learning to stand up? a) like it b) expect it c) don't care d) live with	14. If the travel cot does not have handles for learning to stand up? a) like it b) expect it c) don't care d) live with

e) dislike	e) dislike
15.Should the travel cot have quick folding method? a) like it b) expect it c) don't care d) live with e) dislike	15.If the travel cot does not have quick folding method? a) like it b) expect it c) don't care d) live with e) dislike

Source: Own study based on (Wolniak, Skotnicka, 2008).

The next table 3 presents part of the results of the Kano questionnaire for the travel cot.

Table 3

Part of the Kano questionnaire regarding the travel cot

Attributes	Respondents												
	1		2		3		…	28		29		30	
	P	N	P	N	P	N	…	P	N	P	N	P	N
1.cradle function (skids included in the set)	b	e	a	e	a	e	…	a	e	b	e	a	c
2.a mesh of non-soiling material	a	c	c	d	c	d	…	d	c	a	c	b	e
3.equipped with a thicker, stiffer mattress	a	d	a	e	c	c	…	c	d	a	e	c	d
…	…	…	…	…	…	…	…	…	…	…	…	…	…
13.system of protection against accidental folding	b	e	b	e	b	e	…	a	e	b	e	b	e
14.handles for learning to stand up	c	d	c	d	a	d	…	a	c	a	c	c	d
15.quick folding method.	a	c	b	e	b	e	…	a	e	a	c	a	c

Where: P - positive, N - negative
Source: Own study based on (Wolniak, Skotnicka, 2008).

The last part of the analysis was to determine with the help of Table 1 the group to which the attribute belongs. Table 4 presents some of the results.

Table 4

Determination of the group to which the attribute of the travel cot belongs

Atrybuty	Respondents						
	1	2	3	…	28	29	30
1.cradle function (skids included in the set)	M	O	O	…	O	M	A
2.a mesh of non-soiling material	A	I	I	…	I	A	M
3.equipped with a thicker, stiffer mattress	A	O	I	…	I	O	I
…	…	…	…	…	…	…	…
13.system of protection against accidental folding	M	M	M	…	O	M	M
14.handles for learning to stand up	I	I	A	…	A	A	I
15.quick folding method.	A	M	M	…	O	A	A

Source: Own study based on (Wolniak, Skotnicka, 2008).

4. CONCLUSION

A travel cot is a furniture that parents choose in case of frequent travel as well as for convenience. Having a big house, you can put child to sleep in the part of the house where you are at the moment, such a cot is also necessary for more than one child. It is a very popular furniture and companies producing them are looking for new ways to improve them and to better meet the changing needs of consumers.

The study analyzes the attributes of a designed, improved travel cot. Based on the respondents' answers, the 15 most important attributes of such a cot were identified. A survey was carried out using the Kano questionnaire and the following conclusions were drawn:

- the travel cot has to meet both quality requirements and security requirements. Therefore, the attribute "system of protection against accidental folding" was specified by almost all respondents as a must-have attribute, whereas in the absence of this attribute - respondents indicated the answer "dislike",
- as one-dimensional attributes, most respondents indicated the attribute related, among others, to the "cradle function (skids included in the set)", "two-level mattress level adjustment", "maximum load up to 20 kg" and "wheels which simplify movement of the cot". A cot with such attributes becomes more practical and can be used by a newborn, who often needs rocking, as well as for an older infant, who begins to stand and it is necessary to lower the mattress to a lower position. In addition, a load up to 20 kg guarantees the use of the cot by even a 4-year-old child. Some of the beds on the market do not have such functions in the basic version, which is why it can be a valuable tip for company when designing a new type of travel cot,
- excitement attributes (delighters), according to most respondents, turned out to be attributes such as: "a music box in the basic equipment", "carousel in basic equipment" and "equipped with a thicker, stiffer mattress". Cots on the market in the basic version do not have such attributes, carousel and the music box are attributes from the visual and aesthetic categories that additionally focus attention on the product and therefore for potential customers the presence of such attributes could be an additional incentive to buy such a cot,
- the remaining attributes cannot be included in any of the groups, because the respondents pointed to them as one-dimensional, must-have attributes, excitement attributes (delighters), but also mistakes. For some of the respondents, mistakes, meaning irrelevant attributes, are "removable canopy" and "a large selection of color variants".

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