



ORIGINAL ARTICLE

Attempt to assess tourist products in rural areas based on the Kano method as basis of customer experience

Bartłomiej Walas¹ and Sandor Nemethy^{1,2}

¹The University College of Tourism and Ecology, Sucha Beskidzka, Poland

²The University of Gothenburg, Department of Conservation, Sweden

Abstract - Rural tourism, which is at the same time a kind of broadly understood sustainable tourism, is a concept, although widely used, difficult to define. Many researchers such as M. Jansen-Verbeke distinguish between rural tourism, agritourism and farm tourism (Jansen-Verbeke, 1990). Ecotourism is also often found in many forms with considerable ecological relevance such as tourism to national parks, to areas of high ecological sensitivity, agritourism to organic farms, wildlife tourism/safari with educational goals, visiting touristic destinations, where sustainable living and use of ecosystem services is presented, etc. Rural tourism in our interpretation embraces all of the aforementioned is a very important part of active participation in the life of a farm, in the socio-cultural life of the village and is inherent in its connection to the natural environment. It is ecologically-oriented farming and the protection of natural and socio-cultural environments that are the foundation of ecotourism. The only significant differences that can be identified are some forms of rural tourism that do not fall into the category of ecotourism, such as alienated tourism, as well as a partial focus of ecotourism, out of cities areas but not in rural areas. In the countryside there is also a particular category of tourist stream called "bleisure" – the mixture of business and leisure, a new trend in business tourism linking work and recreation.

Keywords – Kano model, touristic product, rural tourism, quality, satisfaction, customer experience

Received: December 4, 2017

Accepted: December 14, 2017

Tourism in rural areas must be linked to one of the most popular modern trends of life, the concept of "slow", although not exclusively in rural areas. This concept applies to all aspects of life: nutrition, health, accommodation and tourism, and is a result of the ecological phenomenon of consumption.

Different understanding of concepts is important because it defines a different product and the expected benefits of the consumer. Should all the described advantages of tourism in rural areas be a priority for visitors?

The economy and marketing also adjust to the consumption model. One of the theories that explain the phenomena associated with this is the so-called experience economy, created in 1999 by B. Pine and J. Gilmore (Pine and Gilmore, 2011). In this same direction, modern marketing changes to 3.0 which is a holistic approach to the consumer, as a multidimensional and profitable person, a potential co-operating partner

creating a touristic product or a service (Kotler et al. 2010).

Experience is considered a new source of value for customers and is the main reason for their satisfaction. Experiences, emotions, impressions, atmosphere and mood become the true core of the product, very well understood in the sale of tourist services. These experiences arise at many different points (touchpoints) and it is up to them to design a package of services (service design). This is a process in which significant identification of needs, behaviors, and expectations of real and potential tourists, known as "customer experience" (Shaw, 2005). Satisfaction and best customer experience are one of the overriding values of more and more companies, as under the "less ideas more experience" principle, up to 70% of hotel guests expect more personalized experiences (Hotel Trends, 2017). Tools to create tourism products based on experience, emotions and satisfaction of tourists can be searched in the so-called triad of tourist experiences (TTE, Stasiak, 2016) as an analysis of the proportion of individual

Table 1. A slow tourist vs. a conventional tourist

Characteristics of the tourist	Slow	Conventional
Ecological awareness	big	little
Ecological behavior	always	rarely
Social behavior (integration with local environment)	always	rarely
Interest in local culture and regional	always	rarely
Means of transport	alternative	car
Participation in local events	always	sometimes
Hiking or cycling to discover the region	always	sometimes
Purchase of local products	always	rarely
Tasting local cuisine	always	rarely
Health-natural medicine	uses	He thinks ineffective

Source: own research

elements of the 3xE model or in the group of satisfaction survey methods.

Customer satisfaction is described in a variety of models, including the Grönroos quality model, the emotional model, the expected nonconformity model, the PROSAT, the Servqual model, the exchange of justice theory (Balon & Maziarczyk, 2010; Pawlowska et al. 2010; Stoma, 2012), and finally the Kano model, which answers the question of customer satisfaction, changes made to the product.

The Kano method is based on the hypothesis that the characteristics of a given product / service are multifaceted and affect the satisfaction of the customer in a variety of ways. Noriaki Kano, the creator of the method, believes that some of the features of a service are primarily influenced by customer satisfaction, and others influence customer dissatisfaction. This has been applied in the very few cases in relation to the sphere of tourism. The method shows how consumers judge the product and emphasizes the ones that need to be improved in terms of quality. The model can be presented as a coordinate system, on the X axis shows the level of product / service development, while the Y axis shows the consumer satisfaction. Kano created the questionnaire by coding and grouping qualities as follows (Pluta-Olearnik & Wrona, 2014; Wiśniewska, 2009):

- **MUST BE QUALITY** - Must-be requirements, dissatisfiers and basics marked with the letter "M". This is a group where the customer has no idea about the requirements, but is influential in terms of satisfaction or disappointment. An important feature of this group is that meeting the requirements will not result in increased satisfaction, but failure to meet will be the cause of the development of dissatisfaction.
- **MORE IS BETTER** – one-dimensional requirements, satisfiers, functional "the more

the better." The symbol is "O". Group where requirements are expected and desirable. Their implementation will result in increased customer satisfaction, while failure to fulfill expectations will reduce satisfaction and increase disappointment.

- **ATTRACTIVE QUALITY** (attractive requirements, delighter) - attractive, attractive, attractive, is marked with the letter "A". The requirements in this group are above all delightful and unexpected. Failure to do so will not be relevant to the customer's satisfaction, but the fulfillment of these requirements will bring about a significant increase in customer satisfaction.

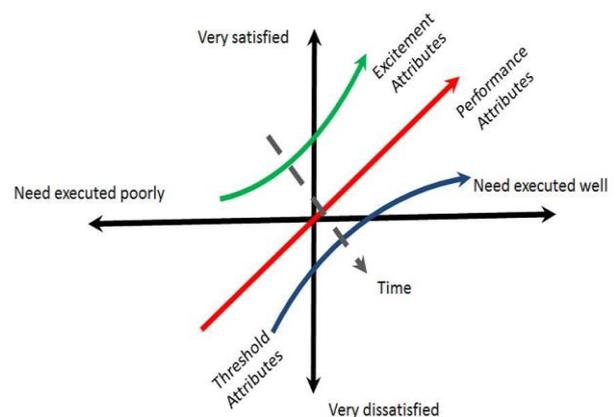


Figure 1. Customer satisfaction level by Kano model

Source: J. Berk, Unleashing Engineering Creativity: The Kano Model <https://www.pddnet.com/blog/2013/03/unleashing-engineering-creativity-kano-model>

Table 2. Characteristics and their evaluation and interpretation

Characteristic		Negative				
Positive		Like	Must be	Neutral	Live with	Dislike
	Like	Q	A	A	A	O
	Must be	R	I	I	I	M
	Neutral	R	I	I	I	M
	Live with	R	I	I	I	M
	Dislike	R	R	R	R	Q
A	Attractive requirements					
O	One-dimensional requirements					
M	Must-be requirements					
I	Indifferent					
R	Reverse					
Q	Questionable					

Source: Wolniak R., Skotnicka B., Metody i narzędzia zarządzania jakością. Teoria i praktyka., Wydawnictwo Politechniki Śląskiej, Gliwice, 2011; Mikulic J., Prebezac D., A critical review of techniques for classifying quality attributes in the Kano Model, „Managing Service Quality” 2011, vol. 21, no. 1, s. 46-66

The Kano model is dynamic, manifesting itself in changes in the nature of the features tested. This is due to the instability of customer needs. Over time, luring features can transform into one-dimensional features. Similarly, with the passage of time and as a result of changing trends and technologies, so far one-dimensional features may become mandatory (Wolniak & Skotnicka, 2014). The results obtained can also be obtained by calculating for each criterion the satisfaction index. Satisfaction Index (WS) and Displeasure Index (WN).

In addition to the basic requirements, so-called "additional requirements" are identified that are not easily identifiable due to their specifications:

INDIFFERENT - indifferent, without distinction, marked with the letter "I", in this group the requirements do not matter much in raising customer satisfaction, and lack will not decrease;

- QUESTIONABLE - questionable, letter "Q". Features that are hard to recognize at a specific time, there are no solid messages about when they will become a priority for the customer and when their presence may compromise customer satisfaction;

- REVERSE - the opposite, symbolizes the letter "R". They appear when the contradiction of a particular characteristic is important for the customer, when the defect of the actual attribute pleases the customer and its occurrence does not. The characteristics listed below are presented in table 2.

Both of these indicators provide an opportunity to demonstrate to what extent the presence or absence of a particular factor influences the level of customer satisfaction. These indicators are calculated from the data of the formulas:

$$WS = \frac{A + O}{A + O + I + M}$$

$$WN = \frac{M + O}{A + O + I + M} \times (-1)$$

With the increase of a specific indicator, the satisfaction or dissatisfaction is enhanced.

Research analysis

Conducting own research based on the questionnaire method was preceded by the selection of 12 features that hypothetically, to a lesser or greater degree, shape the quality of the tourist product, perceived by participants or potential participants in rural tourism. The following features are detailed:

1. food from local agricultural products,
2. proximity of the natural environment,
3. active participation in everyday life of a farm,
4. wealth of health benefits,
5. peace and quiet,
6. contact with the rural population,
7. possibility of active recreation,
8. acquiring new skills,
9. nature protection,
10. low price,
11. detachment from modernization and technology,
12. recommendations.

Empirical research was conducted in 2016 on a group of 100 (ad hoc) people in the Cracow (Małopolska) region with the only division of the respondents into rural areas and cities to see if this feature differentiates expectations. Correlation was also made on the basis of respondents' education. The obtained results were

recorded on the type table of the model features, which shows the scale of occurrence of each type of occurring features of the tested product. The table also shows the satisfaction indicators and the dissatisfaction of these characteristics.

The information collected during the research shows the scale of perception of each characteristic. Among the characteristic of the combination can be distinguished only 3 types - attracting, one-dimensional and neutral (A, I, O).

Correlations of research results were correlated with the characteristics of respondents, such as age and place of residence. These features can have a significant impact on quality attributes. The information gathered during the research allows to verify whether there are certain dependencies between belonging to a given group and the evaluation system manifested in the answers provided.

Table 3. The characteristics of rural tourism products.

Characteristic	A	O	M	I	Q	R	TF Total Feature	WS	WN
1	58	18	8	12	1	3	A	0,79	- 0,69
2	40	27	18	11	2	2	A	0,69	- 0,60
3	18	6	0	52	1	23	I	0,31	- 0,24
4	25	46	24	5	0	0	O	0,71	- 0,49
5	31	50	11	8	0	0	O	0,81	- 0,42
6	35	7	5	53	0	0	I	0,42	- 0,40
7	45	29	9	15	2	2	A	0,75	- 0,55
8	44	14	1	41	0	0	A	0,58	- 0,45
9	19	44	23	11	0	0	O	0,65	- 0,43
10	19	15	1	52	10	10	I	0,39	- 0,22
11	25	11	3	47	14	14	I	0,42	- 0,32
12	33	3	0	64	0	0	I	0,36	- 0,33

1. food from local agricultural products, 2. proximity of the natural environment, 3. active participation in everyday life of a farm, 4. wealth of health benefits, 5. peace and quiet 6. contact with the rural population, 7. possibility of active recreation, 8. acquiring new skills, 9. nature protection, 10. low price, 11. detachment from modernization and technology, 12. recommendations.

Source: own research

Among others, it is worth noting that as many as 24% of the respondents considered health benefits as a mandatory characteristic and 23% of the respondents were close to the natural environment. No other characteristics of the product were defined by respondents as often as compulsory. However, among the features whose presence the respondents do not wish is active participation in the life of the farm, which was determined by as many as 23% of the respondents as an unwanted characteristic. This result is surprising in both the theory and the offer emphasizes the value of such a feature of rural tourism. Is it unnecessary?

The highest satisfaction rate is characterized by silence and peace (WS = 0.81), food from local agriculture (WS = 0.79), active recreation (WS = 0.75) and wealth of health benefits (WS = 0.71). The highest rate of dissatisfaction is similar to that of the products of local agriculture (WN = -0.69) and the proximity of the natural environment (WN = -0.60).

It is also important to note the features that both have a low satisfaction index and a disagreement rate. These features include recommendations from well-known people, detachment from modernization and technology, low price, and active participation in the daily life of the farm. Each of these features is indifferent to the respondent.

Analyzing the respondents' collected responses with regard to their place of residence, there are no significant differences between the responses of urban and rural residents. The place of residence does not affect the decisions of the respondents. However, one can observe minor differences in the perception of two traits - closeness to the natural environment and the possibility of acquiring new skills. For the inhabitants of the village, the proximity of the natural environment is a lure, while for some urban residents this feature is one-dimensional, and for some, also attracting. The difference is also in the perception of the possibility of acquiring new skills - the inhabitants of the village have a divided sentence, most often defining this feature as a lure, while the opinion of urban residents is equally divided between attracting and indifferent characteristics.

In the analysis from the perspective of the age of the respondents (see table 6), persons under 18 and persons over 50 will be ignored, as the number of representatives of these age groups is small. Differences in the evaluation of the examined characteristics between different age groups are very small. You can even say that it is insignificant. The ability to acquire new skills is perceived by people aged 19-35 as a lure. However, for people in the age range 36-50 years it is a neutral feature. Both the recommendations of known people and contact with the rural population are seen as indifferent, while

Tab. 4 Structure of respondents

Age	% on the place of residence
up to 18 years	4,0
19-26	51,0
27-35	11,0
36-50	29,0
over 50 years	5,0
Place of residence	% on the place of residence
city	58,0
village	42,0

Source: own research

for people aged 27-35 this feature is the border between the indifferent and attracting features. For this age range, the fluctuation is also evident in the assessment of the qualities of silence and peace.

Conclusions

None of the features indicated in the study were considered as unwanted or obligatory. Respondents, as the attracting traits, recognized the board containing products local agriculture, the proximity of the natural environment, the possibility of active recreational and sports recreation and the acquisition of new skills. In turn, as one-dimensional features were determined, the wealth of existing health values, peace and quiet and the protection of nature were important.

The third type of attributes to which the respondents classified the rest of the attributes are neutral attributes. They include active participation in the daily life of the farm, contact with the rural population, low price, detachment from modernization and technology, as well as recommendations of people known to them. And this test result seems to be an important guide for the creation of a tourist product in rural areas and marketing communication, as it turns out to be more important than ecological experiences, where the benefits and experiences of tourists should be built.

Table 5. List of product features, taking into account the place of residence of the respondents

Features	city							village						
	A	O	M	I	Q	R	TF	A	O	M	I	Q	R	TF
1	27	8	1	3	1	2	A	30	10	7	9	0	1	A
2	16	15	7	4	0	0	A/O	24	12	11	7	2	2	A
3	7	2	0	25	0	8	I	11	4	0	27	1	15	I
4	13	19	8	2	0	0	O	12	27	16	3	0	0	O
5	13	23	4	2	0	0	O	18	27	7	6	0	0	O
6	15	1	0	26	0	0	I	20	6	5	27	0	0	I
7	26	13	0	3	0	0	A	19	16	9	12	0	2	A
8	19	3	0	20	0	0	A/I	25	11	1	21	0	0	A
9	8	19	9	6	0	0	O	11	25	14	5	3	0	O
10	10	7	0	20	0	5	I	9	8	1	32	3	5	I
11	11	7	2	18	0	4	I	14	4	1	29	0	10	I
12	12	0	0	30	0	0	I	21	3	0	34	0	0	I

1. food from local agricultural products, 2. proximity of the natural environment, 3. active participation in everyday life of a farm, 4. wealth of health benefits, 5. peace and quiet 6. contact with the rural population, 7. possibility of active recreation, 8. acquiring new skills, 9. nature protection, 10. low price, 11. detachment from modernization and technology, 12. recommendations.

Source: own research; LC = total feature

Table 6. Product features including age

charac arefist	Up to 18 years							19-26 years							27-35 years							36-50 years							over 50 years						
	A	O	M	I	Q	R	TF	A	O	M	I	Q	R	TF	A	O	M	I	Q	R	TF	A	O	M	I	Q	R	TF	A	O	M	I	Q	R	TF
1	4	0	0	0	0	0	A	33	7	3	8	0	0	A	5	1	1	3	1	0	A	14	10	3	1	0	1	A	2	0	1	0	0	2	A/R
2	1	0	0	3	0	0	I	19	15	9	4	2	2	A	8	1	1	1	0	0	A	12	11	5	1	0	0	A	0	0	3	0	0	0	M
3	0	0	0	4	0	0	I	13	1	0	24	0	13	I	1	0	0	8	0	2	I	4	4	0	14	1	6	I	0	1	0	2	0	2	I/R
4	0	0	1	3	0	0	I	11	25	13	2	0	0	O	4	5	2	0	0	0	O	10	14	5	0	0	0	O	0	2	3	0	0	0	M
5	1	3	0	0	0	0	O	14	25	7	5	0	0	O	3	3	2	3	0	0	A/OI	12	16	1	0	0	0	O	1	3	1	0	0	0	O
6	1	0	0	3	0	0	I	19	1	4	27	0	0	I	5	1	0	5	0	0	A/I	8	4	1	16	0	0	I	2	1	0	2	0	0	A/I
7	1	3	0	0	0	0	O	20	16	8	7	0	0	O	7	3	1	0	0	0	A	14	5	0	8	0	2	A	3	2	0	0	0	0	A
8	1	0	0	3	0	0	I	25	5	1	20	0	0	A	5	3	0	3	0	0	A	11	5	0	13	0	0	I	2	1	0	2	0	0	A/I
9	0	1	2	1	0	0	M	14	17	12	7	1	0	O	2	7	2	0	0	0	O	3	16	5	3	2	0	O	0	3	2	0	0	0	O
10	0	0	1	3	0	0	I	7	8	0	30	0	6	I	2	1	0	5	1	2	I	6	6	0	14	1	2	I	4	0	0	0	1	0	A
11	0	0	0	4	0	0	I	15	4	3	20	0	9	I	1	2	0	7	0	1	I	9	2	0	14	0	4	I	0	3	0	2	0	0	O
12	0	0	0	4	0	0	I	13	2	0	36	0	0	I	6	0	0	5	0	0	A	9	1	0	19	0	0	I	5	3	0	0	z	0	A

food from local agricultural products, 2. proximity of the natural environment, 3. active participation in everyday life of a farm, 4. wealth of health benefits, 5. peace and quiet 6. contact with the rural population, 7. possibility of active recreation, 8. acquiring new skills, 9. nature protection, 10. low price, 11. detachment from modernization and technology, 12. recommendations.

References

- Balon U., Maziarczyk, A.** (2010): Customer satisfaction in the quality management system, Tadeusz Sikora (ed.), [In:] Quality management. Improvement of the organization, Polish Scientific Publishers PTTŻ, Krakow 2010. ISBN: 978-83-929209-4-6 (*In Polish, original title: Satysfakcja klienta w systemie zarządzania jakością., Tadeusz Sikora (red.), [w:] Zarządzanie jakością. Doskonalenie organizacji, Wydawnictwo Naukowe PTTŻ, Kraków 2010*)
- Flick Uwe** (2010): Designing qualitative research. SAGE Publications Ltd; 1 edition (April 1, 2008) ISBN 13: 978-0761949763; ISBN-10: 0761949763 (*Polish edition: Projektowanie badania jakościowego). Wyd. 1, PWN, Warszawa, 2012*)
- Cieślakowski K., Chudy-Hyski Dorota, Żemła M.** (2008): The quality of the offer of Polish ski resorts "Ekonomia. Market, Economy, Society 21/2008. (*In Polish, original title: Jakość oferty polskich ośrodków narciarskich. Ekonomia (Ekonomia. Rynek, Gospodarka, Społeczeństwo), issue: 21 / 2008, pages: 172-197, on www.ceeol.com*)
- Gardner N.,** (2009): A manifesto for slow travel, <http://www.slowtraveleurope.eu/> [6.09.2017].
- Głowaciński Z.** (2001): Ecological basis for tourism development (*in Polish, original title: Ekologiczne podstawy rozwoju turystyki*) Aura, nr 10, 2001, s. 4-7, il. sum. s. 2
- Hotel Sales & Marketing Trends 2016,** Profitroom, Poznań, 2016.
https://u.profitroom.pl/2015.profitroom.pl/uploads/Trends_2016_EN.pdf
- Jansen-Verbeke M.** (1990): The role of tourism in rural areas in Europe, Tourism Problems, 1/2 (47/48): 36-48, Publ. Institute of Tourism, Warsaw, 1990. (*Polish edition: Znaczenie turystyki na terenach wiejskich w Europie, Problemy Turystyki, 1/2 (47/48): 36 -48, Wyd. Instytutu Turystyki, Warszawa, 1990*).
- Jędrzyak T.** (2010): Rural cultural tourism, PWE, 2010 (*in Polish, original title: Wiejska turystyka kulturowa, PWE, 2010*)
http://www.pwe.com.pl/geografia/wiejska_turystyka_kulturowa,p1822116402
- Knecht D.** (2009): Agrotourism in the agrobusiness, C.H. Beck Publishers, Warszawa, 2009. (*In Polish, original title: Agroturystyka w agrobiznesie. Warszawa: Wydawnictwo C. H. Beck, 2009*).
- Kotler P., Kartajaya H., Setiawan I.** (2010): Marketing 3.0. From Products to Customers to Human Spirit. ISBN: 978-0-470-59882-5; Hoboken: John Willey & Sons, 2010;
- Mikulic J., Prebezac D.** (2011): A critical review of techniques for classifying quality attributes in the Kano Model, „Managing Service Quality” 2011, vol. 21, no. 1
- Młynarczyk K.** (red. 2002): Agritourism. Olsztyn: Publisher of the University of Warmia and Mazury, 2002 (*in Polish, original title: Agroturystyka. Olsztyn: Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego, 2002*). ISBN: 83-7299-166-9.
- Pawłowska B., Witkowska J., Nieżurowski L.** (2010): Modern concepts of customer orientation strategies, PWN, 2010 (*in Polish, original title: Nowoczesne koncepcje strategii orientacji na klienta, PWN, 2010*).
- Pine B., Gilmore J.** (2011): The Experience Economy, Harvard Business Press, 2011
- Pluta-Olearnik M., Wrona S.** (2014): Services 2014 Selected determinants of service development, Publisher of University of Economics in Wrocław, Wrocław 2014. (*in Polish, original title: Usługi 2014 Wybrane uwarunkowania rozwoju usług, Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2014*).
- Wiśniewska, M.** (2009): Recognition and satisfaction of customer requirements using the Kano model, In: Quality problems, 2009 (*in Polish, original title: Rozpoznanie i zaspokojenie wymagań klienta z wykorzystaniem modelu Kano, W: Problemy Jakości, 2009*).
- Sawicki B., Mazurek-Kusiak A. K.** (2010): Agritourism in theory and practice, Wydawnictwo Uniwersytetu Przyrodniczego, Lublin, 2010. Publ. University of Life Sciences, Lublin, 2010 (*in Polish, original title: Agroturystyka w teorii i praktyce, Wydawnictwo Uniwersytetu Przyrodniczego, Lublin, 2010*).
- Shaw C.** (2005): Revolutionize Your Customer Experience, Palgrave Macmillan, New York, 2005; eBook ISBN 978-0-230-51345-7; Hardcover ISBN 978-1-4039-3603-5
DOI [10.1057/9780230513457](https://doi.org/10.1057/9780230513457)
- Stasiak A.** (2015): Triad of tourist experience and the "wow!" Effect, the basis for creating a modern tourist offer; in: Tourism economy in the region. Undertaking. Local government. Cooperation, scientific papers of the University of Economics, No. 3.79, Wrocław, 2015 (*in Polish, original title: Triada doświadczeń turystycznych i efekt „wow!” podstawą kreowania nowoczesnej oferty turystycznej, W: Gospodarka turystyczna w regionie. Przedsiębiorstwo. Samorząd. Współpraca, prace naukowe Uniwersytetu Ekonomicznego, nr.379, Wrocław, 2015*).

Stoma M. (2012): Models and methods for measuring the quality of services, Lublin, 2012 (*in Polish, original title: Modele i metody pomiaru jakości usług. Q&R Polska Sp. z o.o. Lublin; ISBN 978-83-934606-1-8*).

Sznajder M., Przezbórska L. (2006): Agrotourism, Polish Economic Publisher (*in Polish, original title: Agroturystyka, Polskie Wydawnictwo Ekonomiczne, Warszawa, 2006*)

Sztorc M. (2011): Ecotourism - a new tourist product of the region, Aura, 07/2011 (*in Polish, original title: Ekoturystyka – nowy produkt turystyczny regionu, Aura, 07/2011*).

<http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.dl-catalog-bae73a0f-f4fe-4ea3-8598-80aaa15acb0f>

Wiśniewska M. (2009): Recognition and satisfaction of customer requirements using the Kano model, "Quality problems", 2009 (*in Polish, original title: Rozpoznanie i zaspokojenie wymagań klienta z wykorzystaniem modelu Kano, „Problemy Jakości”, 2009*).

<http://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-article-BAT7-0015-0011>

Wolniak R., Skotnicka B. (2011): Quality management methods and tools; publ. no. 4. Silesian University of Technology Publ. Gliwice, 2011 (*in Polish, original title: Metody i narzędzia zarządzania jakością, Wyd. 4, Wydawnictwo Politechniki Śląskiej, Gliwice, 2011*).

<https://oditk.pl/pl/wiedza/arttykul/zobacz/model-kano-i-cechy-idealnego-produktu/>