

USING KANO TWO DIMENSIONAL SERVICE QUALITY CLASSIFICATION AND CHARACTERISTIC ANALYSIS FROM THE PERSPECTIVE OF HOTELS' CLIENTS OF ORADEA

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Abstract

Kano's two-dimensional quality model is one of the best known and most used direct methods, in service quality appreciation. The main purpose of this paper is to apply and testing a two-dimensional model proposed by Noriaki Kano, in a real situation of four hotels from Oradea. The first part of the paper presents, the stages needed to build the Kano model, in the context of researches regarding the degree of satisfaction of the consumer of touristic services and the advantages of using this method. The second part of the paper describes a market research, through questionnaire, among the 125 clients of four hotels with over 50 rooms and located in key areas for the urban tourism.

The results obtained show the degree of global satisfaction of the clients surveyed and allow the framing of the quality attributes into the three main categories(plus one) suggested by Kano. Applying Kano's model we have a position of consumers face tinting of the quality characteristics, this is impossible in classical quality assessment services.

Key words: Hotel, Quality, Satisfaction, Kano's two-dimensional quality model, Survey, Oradea.

JEL Classification: M31

I. INTRODUCTION

Two major instruments were developed in time in order to analyze the concept of consumer satisfaction and they are: the Importance-Performance Analysis (IPA) and SERVQUAL.

The roots of current methods to measure the consumers' satisfaction are to be found in the first efforts to investigate the consumer's decision making process. Other efforts concentrated on setting up models to determine the consumer's attitude are the ones of Fishbein (1963) and Rosenberg (1956), followed by more complex models of consumer's satisfaction (Oliver, 1996; Tse and Wilton, 1988, pp. 204–212). Approaches regarding the perception of the quality of services and the identification of the evaluation attributes are to be found in many studies and empirical research (Parasuraman et. al., 1988, pp.12-40; Parasuraman et. al., 1993, pp.1-12). The Importance-Performance Matrix (IPA) suggested by J.A. Martilla and J.C. James in 1977 is meant to determine the attributes which managers should change in order to increase the quality of services and, therefore, the consumers' satisfaction. Important attributes for the target-audience in what the product, service or destination choice concerns are determined using the focus-group method As sources used to determine the attributes considered important, we mention the literature in the field and/or the suggestions of the managers in the field. The identified attributes

are positioned on a Likert scale and the respondents are asked to establish the importance and to evaluate the performance of a given product, service or destination. According to the initial variant, any attribute positioned within the matrix with a higher score for the importance than for performance is a candidate for efforts for improvement. The higher the discrepancy between importance and performance, the more improvement efforts are needed for it is assumed that a high discrepancy means high dissatisfaction. IPA was applied in different fields, such as: health, education, banking, industry, service quality and tourism (Lin, Tsai et al., 2005, pp. 84-87; Ban, 2012). In the field of tourism, IPA was applied in order to determine the factors of selection of a hotel, in order to establish the critical attributes of the performance of the tourist guide, to identify the competitiveness factors of the destination or to draw up different strategies (Deng, 2007).

After the filling in the questionnaires, several problems have been identified:

- The inter-item variations obtained for importance and performance are low, thus almost useless;
- Invariably, the respondents give high values to the importance of variables and slightly lower values, but increasingly higher, to the performance of the attributes;
- The answers are influenced by the cultural determinants of the respondents;

- The SERVQUAL scale usually used to set up the Importance-Performance Matrix does not make the distinction between the types of attributes;
- The results are not relevant and do not allow the analysis of the competitiveness, distinctively factors among the hotel entities evaluated.

II. KANO'S TWO-DIMENSIONAL QUALITY MODEL

In the past, the consumer's satisfaction was perceived in a single dimension, meaning that the more the satisfaction of the desired quality attributes, the more satisfied the consumer was. Several studies tried to establish a connection between the physical and psychological aspects of quality in order to see the way in which the characteristics of products and services relate to the consumer's satisfaction or dissatisfaction (Yang, 2005).

Kano (1984) developed a model by which he distinguished different types of quality attributes. Kano's model divides the quality attributes of products and services into three distinct categories (*attractive; one-dimensional; must-be*) and in addition *indifference* category and *reverse, for errors in research*, each of them differently influencing the consumer's satisfaction. Other studies regarding the consumer's satisfaction suggest that the quality attributes can be understood by using three categories: the basic factors, the performance factors, and the stimulation factors. Levitt suggests two categories of attributes: *core attributes* and *facilitator attributes* (Levitt, 1983). We can see the correspondences among the three models. The basic factors are indispensable, their below the average level creating dissatisfaction, yet their presence at an average level does not create satisfaction.

Noriaki Kano, Fumio Takasashi and Nobuhiko Seraku et al. (1984) suggested the two-dimensional model of quality, discovering that when certain elements defining quality are present, they cannot generate satisfaction, yet they can generate indifference or dissatisfaction.

Kano's model of satisfaction describes the relation between the consumers' satisfaction and the quality of the product, between the consumer's satisfaction and the quality of services (Kano, Takahashi et al, 1984, pp.33-41).

The best known and most used direct methods are: the Critical Incident Technique, Problem Detection System, Pims, Customer Satisfaction Serey, Kano model and Servqual method (Milisavljević, 2009 in Curaković et. al.).

Kano's two-dimensional quality model makes the distinction among three main types of requirements of the product which influence the consumer:

1. Must-be requirements - if these requirements are not met, the consumer will be extremely dissatisfied. On the other side, the consumer considers these requirements as being inherent and their

fulfilment does not lead to the increase of satisfaction. These compulsory requirements are main characteristics of the product and represent a decisive competitively factor.

2. One-dimensional requirements – these requirements are in direct correspondence with the degree of satisfaction. The better they are met, the higher the consumer's degree of satisfaction and reverse.

3. Attractive requirements – these requirements tackle with the characteristics of the product having the highest influence on the consumer's satisfaction. They are usually explicitly required by the consumer.

Additionally, characteristics in "indifferent" category are identified, these do not influence directly consumers' satisfaction. They should be kept at a reasonable quality level, without any improving efforts.

The advantages of using Kano's method are synthetically presented below (Sauerwein, Bailom et al., 1996, pp.2-3):

- It allows the development of products. For example, it is useless to invest in compulsory requirements if they are at a satisfactory level, yet it is better to act upon the one-dimensional and attractive requirements;
- The requirements regarding the product are better understood. The characteristics of the product which influence better the consumer's satisfaction can be identified;
- Kano's model is used in order to establish the importance of the product's features and, thus, to create the optimal prerequisites for the activities directed towards the development of the product;
- This model provides a valuable aid in the selling-buying process. If two requirements of a product cannot be ensured simultaneously due to technical or financial reasons, the characteristic with the highest influence on the consumer's satisfaction can be determined;
- The three types of requirements are usually different in the expectations of different segments of consumers, an aspect possible to be determined;
- The discovery and supply of attractive requirements create a large range of differentiation possibilities.

The stages of Kano's model set up:

I. Identification of the requirements/ characteristics of the investigated product, based on exploratory research. Qualitative research methods are used. Griffin and Hauser (1993) have showed that it is enough to interview 20-30 consumers from homogeneous segments in order to determine 90-95% of all the possible requirements. The efficient approach is that which investigates the problems noticed by the consumer, being a good way to determine what is important for the consumer.

II. The setting up of Kano's questionnaire consists in drawing up two questions for each researched requirement/characteristic. The first question concerns the consumer's reaction to the situation when the product has a certain characteristic and the second concerns the reaction when the product does not have that certain (the functional form and the dysfunctional form of the question). There are five choices of answer: 1. Like 2. Must-be 3. Neutral 4. Live-with 5. Dislike.

According to the answers obtained to the two questions for each characteristic it is established the framing of the characteristic, by drawing Kano's evaluation table.

Q is given when the requirements are not situated in any category due to consumers' irrelevant or wrong answers.

Moreover, compared to Kano's model, it is useful to set up a hierarchy of the product's characteristics according to the importance given by the consumers. It helps establishing the priorities for the development of the product and the carrying into effect of the necessary improvements.

III. Methods to gather the consumers' opinions are established, the questionnaire-based interview being the most effective.

IV. Evaluation and interpretation of results. After the results to the functional and dysfunctional questions are obtained, the results concerning the characteristics of the products are posted in the evaluation table. *Frequency evaluation* is done by establishing the weight of each category in the answers given. The category with the highest frequency is the one defining the characteristic. The distribution of answers on several categories denotes the existence of several segments of consumers.

The *customer satisfaction coefficient* (CS) is calculated, when the satisfaction can be increased by meeting the requirement of the product. The customer satisfaction coefficient indicates how strongly a product's characteristic can influence the satisfaction or, in case of non-supplying that characteristic, how much it influences the customer's dissatisfaction. The average of the impact of satisfaction is calculated as:

$$\frac{A+O}{A+O+M+I} \quad (1)$$

The average of the impact upon dissatisfaction is calculated as:

$$\frac{O+M}{(A+O+M+I) \times (-1)} \quad (2)$$

The customer satisfaction coefficient has values between 0 and 1. The closer it comes to 1, the higher the impact and reverse. When the coefficient is negative, the closer it comes to (-1) the higher the impact on dissatisfaction.

Moreover, the *index of quality improvement* (IQ) can be calculated, which takes into consideration also the performances of the competitors' products.

Q1= the relative importance of characteristic x (evaluation of own product from the perspective of characteristic – evaluation of the competitor's product from the perspective of characteristic)

III. METHODOLOGY

The main objective of this paper, among few others that are not detailed here, is to apply and test the Kano model for 4 particular hotels from Oradea, in order to obtain a quality characteristics structure for their services. Other types of direct investigation of the quality characteristics such as characteristics coliniarity or the small inter-item variation of the characteristics important are difficulty to apply here.

Derivate objectives of our paper are:

- The analysis of the structure of quality;
- characteristics, from the respondents' point of view, according to Kano's model, in order to determine the way each of them influence the consumers' satisfaction;
- The evaluation of the respondents' global satisfaction degree in what the quality of the services concerns, and implicitly, of the compliance to the quality characteristics requirements.

In 2012 a number of 125 questionnaires was applied to four hotels' clients, through operators. We have chosen 4 4-stars hotels from Oradea (Nevis, Ramada, Elite and Maxim hotels), that have similar offers, a combination of business and spa, a capacity of over 50 rooms, and key emplacements for the urban tourism.

The criteria we used when choosing these hotels was the disponibility during the period we conducted our research, the structuring of our respondents (Romanian and tourists from abroad) being determined by the structure of the clients of the 4 hotels during that particular period of time. The questionnaires were filled in with the help of operators (master students, during their compulsory practice), at the hotels' reception, during 2 weeks in June 2012.

The research method was the survey and the instrument for data gathering was the questionnaire with direct application with operator. Data were collected using a questionnaire with 17 questions, grouped in 2 sections. The first section had 11 questions, out of which 9 were closed and 2 open ones. The purpose of the questions from this section was to collect data regarding the fact whether the tourist is a first time client at the hotel or he is a returning one, his global satisfaction regarding the services, measured on a 5 Likert type scale, the reason of the choice of the hotel and the information source, the evaluated importance of the quality characteristics and the evaluation of the hotel from this perspective and from the perspective of the two sets of questions used in Kano's model (in which we investigate the positioning of the tourist to the presence or absence of certain quality characteristics, on a 5 scale with alphanumeric

variables. The open questions regarded the positive and negative aspects identified by the clients in what the services concerns, these information were not detailed in our present study. The second section had 6 closed questions, regarding socio-demographic characteristics of the respondents (genre, age, status, residence, revenue and the most recent diploma).

For the establishment of the items, we departed from the SERVQUAL scale, by adding the *Internet access*, a specific attribute for urban tourism. The questionnaire had a number of questions regarding the quality characteristics of the hotel's services. These quality characteristics are the following: the room facilities are appropriate, the room is clean enough, the hotel has sufficient restaurant facilities, the staff has an appropriate and professional look, the location of the hotel, the staff provide correct information to guests, the staff is able to offer services in a short period of time, the staff is able to resolve guests' problems, the staff is able to provide information in a short period of time, the availability of staff, clients complaints are resolved quickly, different payment facilities are available, the safety of the installations in the hotel, service professionalism, service customization, staff's friendliness, proper opening hours of hotel's facilities, the hotel has entertaining facilities, big variety and proper quality of meals, internet connection is available, aesthetics of rooms and of the hotel.

The validity of the questionnaire was verified with the α Cronbach coefficient, the value obtained being a satisfactory one (0,827). This is a coefficient of internal consistency. It is commonly used as an estimate of the reliability of a psychometric test for a sample of examinees. All the data were computed using SPSS v.20 statistical software.

In order to achieve Kano's model there were double questions inserted in the questionnaire for each quality requirement, which records the reaction of the consumers to the situation of each characteristic and the situation of each characteristic missing.

Moreover, in order to create the Importance Performance Matrix, was investigated the importance given to the hotel product of the entities researched, from the perspective of those particular characteristics.

IV. RESULTS AND DISCUSSIONS

Our sample of consumers had 125 subjects, Romanian (65%) and foreigners (35%). Out of the 125 clients of our hotels, 48% were accommodated at that specific hotel for the first time, while 52% were returning customers.

Most of our subjects are in Oradea for business (44%), 12% of them are in transit, while 9.6% are respectively here for leisure, visiting or attending a conferences. 60% of our respondents are male, and in what their age is concerned, most of them are between 36 and 45 years old (37.6%), followed by the subjects between 26-35 years (33.6%).

In what the degree of satisfaction of the tourists of our sample is concerned, we have conducted a separate analysis on the Romanian and foreign tourists. We have asked all our subjects to evaluate how satisfied they are with the services at the hotel they are accommodated at.

The majority of the clients are satisfied and very satisfied with the quality of the services in the hotel they stay (93%), and only 7% of the tourists consider that the services in the hotel are of an average quality.

A closer and deeper analysis of the satisfaction of the subjects from our questionnaire in what regards the quality of the services show that the most significant difference between the Romanian citizens and the foreigners regards the tourists that are not satisfied nor unsatisfied. While 8.64% of the Romanians consider that they are not satisfied with the quality of the hotel's services, only 4.5% of the foreigners have a similar opinion, which represent almost a half of the Romanian's percentage. (Table 1)

Table 1. Degree of satisfaction of the clients from our sample with the hotel's services

	Romanian citizens absolute frequencies	Foreigners absolute frequencies	Total	Romanian citizens relative frequencies	Foreigners relative frequencies-
Neither satisfied, nor unsatisfied	7	2	9	8.64%	4.5%
Satisfied	31	14	45	38.27%	31.81%
Very satisfied	43	28	71	53.08%	63.36%
Total	81	44	125	100%	100%

Source: Authors' calculations based on the answers from our questionnaire

For each of the characteristics mentioned earlier, we have constructed the cross-tabulation table between the answers of the subjects from our questionnaire, to the functional and non-functional questions, that concern their expectations regarding these characteristics. For example, the distribution of the answers for the functional and non-functional

question related to the room facilities is, as follows in Table 2 where "A" stands for attraction quality elements, "O" for one-dimensional quality elements, "M" for must be quality elements and "I" for indifferent quality elements and "Q" is given when the requirements are not situated in any category due to consumers' irrelevant or wrong answers.

Table 2. Kano's evaluation table regarding the room facilities

Consumers' expectations regarding the product, Functional vs. dysfunctional questions	1. I like it that way	2. It must be that way	3. I am neutral	4. I can live with it that way	5. I dislike it that way
1. I like it that way	2 (Q)	0 (A)	0 (A)	11 (A)	36 (O)
2. It must be that way	5 (R)	9 (I)	3 (I)	17 (I)	31 (M)
3. I am neutral	1 (R)	4 (I)	1 (I)	2 (I)	0 (M)
4. I can live with it that way	0 (R)	0 (I)	0 (I)	3 (I)	0 (M)
5. I dislike it that way	0 (R)	0 (R)	0 (R)	0 (R)	0 (Q)

Source: Authors' calculations based on the answers from our questionnaire

When indicator of increased satisfaction is close to 1, it means that the element is important in affecting customer satisfaction; similarly, when indicator of decreased dissatisfaction is close to 1, it means that the element is important in affecting customer dissatisfaction.

From 21 characteristics considered we obtain the following classification, after Kano's model (Table 3):

- 8 were in "one-dimensional" category;
- The only must-be quality element is "the staff being able to offer services in a short period of time";
- And the attraction element is "the friendliness of staff".

Most of characteristics were appreciate as being in "indifferent" category, mean 11.

Eight of the characteristics are considered as one-dimensional quality elements. The satisfaction of the clients is significantly affected (one-dimension category) by "the cleanness of the rooms", followed by the "aesthetics of rooms and of the hotel", "availability of the internet connection", "the staff is able to resolve guests' problems" and the fact that "the clients' complaints are resolved quickly", "availability of staff", "the staff is able to provide information in a short period of time", "the availability of staff" and "the staff provide correct information to guests" (Table 3).

Table 3. Kano two dimensional service quality classification and characteristic analysis

Product characteristics	A (%)	O (%)	M (%)	I (%)	R (%)	Q (%)	Elem. classif.	Coefficient of increased satisfaction	Coefficient of decreased dissatisfaction
The room facilities are appropriate	8,8	28,8	24,8	31,2	4,8	1,6	I	0,40	0,57
The room is clean enough	3,2	52,8	19,2	18,4	4,8	1,6	O	0,60	0,77
The hotel has sufficient restaurant facilities	19,2	19,2	8	46,4	4	3,2	I	0,41	0,29
The staff has an appropriate and professional look	20,8	16	18,4	40,8	1,6	2,4	I	0,38	0,36
The location of the hotel	17,6	22,4	15,2	39,2	4,8	0,8	I	0,42	0,40
The staff provide correct information to guests	8	44,8	19,2	22,4	5,6	0	O	0,56	0,68
The staff is able to offer services in a short period of time	9,6	28,8	32	20	7,2	2,4	M	0,42	0,67
The staff is able to resolve guests' problems	9,6	32	28,8	20,8	8	0,8	O	0,46	0,67
The staff is able to provide information in a short period of time	9,6	36,8	25,6	24,8	1,6	1,6	O	0,48	0,64
The availability of staff	12,8	40	22,4	20,8	2,4	1,6	O	0,55	0,65
Clients complaints are resolved quickly	12,8	44	18,4	20,8	4	0	O	0,59	0,65
Different payment facilities are available	12,8	23,2	16,8	42,4	2,4	2,4	I	0,38	0,42
The safety of the installations in the hotel	9,6	33,6	16	38,4	1,6	0,8	I	0,44	0,51
Service professionalism	13,6	29,6	12,8	36	5,6	2,4	I	0,47	0,46
Service customization	18,4	16	17,6	43,2	1,6	3,2	I	0,36	0,35
Friendliness of staff	34,4	21,6	11,2	27,2	4,8	0,8	A	0,59	0,35
Proper opening hours of hotel's facilities	20,8	18,4	9,6	48	3,2	0	I	0,40	0,29
The hotel has entertaining facilities	24,8	11,2	12	44	6,4	1,6	I	0,39	0,25
Big variety and proper quality of meals	22,4	12	12	46,4	5,6	1,6	I	0,37	0,26
Internet connection is available	21,6	34,4	13,6	24,8	3,2	2,4	O	0,59	0,51
Aesthetics of rooms and of the hotel	27,2	28,8	13,6	25,6	3,2	1,6	O	0,59	0,45

Source: Authors' calculations based on the answers from our questionnaire

More than that, interesting is the fact that only 6 of them have a direct influence on clients' satisfaction (first three are: "the room is clean enough", "the staff provide correct information to guests" and "the staff is able to resolve guests' problems").

The dissatisfaction of the clients is affected mostly by the "rooms not being clean", "the staff not providing correct information to guests", "the long time the staff offers their services" and by the "incapacity of the staff to resolve guests' problems" (Table 3).

CONCLUSIONS AND FUTURE RESEARCH

Applying Kano's model we have identified the position of the consumers with regard to the quality characteristics, which is impossible in classical quality assessment services.

As a result of our research, using Kano's model we have structured the quality characteristics in 3 different groups, as well as we have identified the measure in which each characteristic has a contribution at the global satisfaction. This result allows managers to focus on those characteristics that are significant and in accord with the hotel's strategy. The 8 characteristics that were grouped in the "one-dimensional" type are directly related to the consumers' satisfaction, their improvement would lead to the increase of the satisfaction regarding the services. The must-be characteristic is "the staff being able to offer services in a short period of time" - and this one has to be fulfilled, as its lack leads to dissatisfaction. "The friendliness of staff" is the attractiveness characteristic that enables the differentiation between hotels and the proportional increase of the consumers' satisfaction.

One of the results of our research is the global evaluation of the satisfaction of our subjects – 93% of them being satisfied and very satisfied with the quality of the services in the hotel they stay, and only 7% of the tourists consider that the services in the hotel are of an average quality.

Kano's model is used to understand better relationship between performing criteria and consumer satisfaction and to solve multi-criteria dilemma through the identification of key characteristics (Chen, Chuang 2008). The advantages of Kano's model are known in

new product development and product design (Sauerwein, Bailom et al., 1996; Bilgilia, Erciş et al., 2011). This study strengthens importance that consumers give staff in evaluating the quality of service in relation to aspects of material base.

Empirical studies (Ban, 2008) show that consumers evaluate importance the least distinctive quality criteria, under 3 points difference by enclosing all the criteria (between 6.0 and 8.8) or about 1 point difference (3.81-4.97) (Blešič, I., Ivkov-Džigurski et al., 2011, 5-13). Moreover, in another study (Ban and Popa, 2010) consumers have rated the importance of the criteria for quality of personnel in tourism with values that fall between 3.82 and 4.62, so under a point. In such cases the study becomes almost useless, the decision to concentrate on one or another criteria is very hard to take.

Considering the time of collecting the opinions of consumers, we admit that these are influenced by the perception of specific services received at the hotel where they are staying. Even so, the information is useful to distinguish between characteristics allow the services have an impact on customer satisfaction and towards consumers demonstrates indifference.

One important limitation of Kano's model application was data collection through the numerous and difficult questions. The Kano's model difficult application due to too many questions was resolved using regression analysis method (Chen, 2012).

One direction to increase the benefits of using Kano's model is fuzzy modeling to analytical hierarchy process. Wang and Wang (2014) combined fuzzy analytical hierarchy process in order to obtain consumer preferences core attributes with fuzzy Kano model with zero-one integer programming to incorporate customer preferences and customer perceptions into the decision-making process of product configuration.

We intend to use fuzzy modelling for an analytical hierarchy process of the quality characteristics of the touristic offer (Ban and Ban, 2012, pp.474-480) based on a fuzzy Kano model for a better tourist product configuration.

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