

Classification of Customer Requirements Using the Kano Model - A Case Study at the Project of (Basmaya Residential City)

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Abstract: *The success of the projects is achieved by providing what customers want and using the Kano model helps to categorize the requirements of the customers, focus on the important requirement, and thus lead to achieving the goal of the projects is to win the satisfaction of customers. The research problem is that the management of the project does not give much attention to classify the needs and desires of customers in order to meet them and not to use modern quality management tools, including the Kano model, in order to achieve these desires and needs. The aim of the research is to categorize the requirements of customers in order to focus on the important requirements the research is based on the use of the Kano model in classifying customer requirements to determine customer satisfaction with the project. The study adopted the case study methodology, and collected research data and information through personal interviews, Questionnaire in order to reach the desired results; a number of statistical analysis tools were used. The research reached a number of results, the most important of which is the classification of the requirements (appropriate price and convenient installment) within the basic qualities that the project must provide in order to win customer satisfaction.*

Keywords: Kano Model, Classification of Customer Requirements

1. Introduction

The modern administrative thought of quality is characterized by the capacity of the horizon and the constant search for renewal and change within useful frameworks seeking to establish the foundations of quality management. One of the most important advantages of quality management for many other departments is its openness to other sciences, acceptance of many of its concepts and ideas, as well as the continuous development of its ideas and concepts and the continuous introduction of new concepts and ideas suited to the dynamic environment, one of the modern concepts in quality management that has started to receive the attention of researchers and specialists in quality science is the Kano model because of its focus on customers. The model focuses on identifying the needs and requirements of customers in the project and then classifying them in order to achieve customer satisfaction.

The great challenge facing the management of projects today is how to provide projects of high quality and reasonable prices for customers, which requires them to search for the use of modern methods and tools to help them understand the requirements of customers and classification To meet them when projects planning, among the tools focused on listening to voice Customers are the Kano model, which classifies and arranges the requirements that have the greatest impact on customer satisfaction. After that, it is important to provide and improve these requirements in order to win customer satisfaction, As competition for new markets and customers increases, customer requirements have been widely recognized as a key determinant of successful project design and development, and companies are making an effort to understand customers to increase their satisfaction by improving their projects and services.

2. Methodology of research

1) Problem of research

The researcher conducted a field survey of the Basmaya residential project under study to learn in detail the extent to which the project management and employees are familiar with TQM tools in general and the Kano model in particular and its role in the classification of customer requirements, The problem of research is that the management of the project does not give much attention to the classification of customer requirements and the use of modern quality management tools in order to achieve this classification of requirements and achieve customer satisfaction, the problem of research can be summarized by the following questions:

- Are basic, attractive and one-dimensional customer needs identified when designing a project?
- Is there a possibility to apply the Kano model to the selected project?

2) Objectives of research

The current research seeks to achieve the following objectives: -

- Classification of customer requirements in order to focus on the important requirements and provide them in the project.
- Improve the project through precise identification and understanding of the needs and requirements of the basic, attractive and one-dimensional customers.

3) Importance of research

The current research is important both in its theoretical and applied aspects, and is reflected in all of the following:

- Contribute to the improvement of the project through the use of Total Quality Management is Kano model.
- Demonstrate the advantages of the Kano model for use in improving the project level.

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4) Society and the research sample

The Basmaya Residential Project was selected as a location for the practical (applied) side of the research for the following reasons:

- High prices of apartments.
- Project weakness in the classification of requirements and needs of customers.

A sample of (55) customers from the project was selected.

3. Previous Studies

1) Study of Bilgili & Others (2011)

Title of Study	Kano Model Application in New Product Development and Customer Satisfaction (Adaptation of traditional Art of Tile Making to Jewelries)
Problem of Study	Not to keep pace with products related to the jewelry industry to the conditions of intense competition of the design and production of new products to achieve the goals of growth and development in the jewelry sector
Objectives of Study	Evaluate customer expectations using KANO model to develop new product and achieve consumer satisfaction and market requirements
The location of the study	City of Erzurum / Turkey
The method of analysis	An Empirical Study
The most important conclusions	1. The adaptation of traditional Turkish art to the brick jewelry industry is an important opportunity because it positively affects the expectations and levels of customer satisfaction. 2. These products can provide profits to companies while achieving their competitive advantage.

2) Study of Barzoki & Others (2014)

Title of Study	Identifying Attractive Behaviors Of Managers Based On Kano Model In Isfahan Province Gas Company
Problem of Study	The company suffers from a variety of factors, including (managers' behaviors) that affect their motivation and performance, which is reflected in the product quality, productivity and reputation of the company
Objectives of Study	Proposing a model for the analysis and classification of the needs of employees by studying the behaviors of managers based on the model (Kano)
The location of the study	Isfahan Gas Company / Iran
The method of analysis	Case Study
The most important conclusions	The use of Kano model can identify five types of manager behaviors that can affect staff motivation: basic, performance, attraction, neutral, and reverse behavior.

KANO Model

Dr Noriaki Kano, a Japanese Professor and international consultant (Goddard et al, 2014) first developed the Kano model. He received the individual Deming Prize in 1997. In the late 1970s and early 1980s he laid the foundation for an approach for “attractive quality creation” –commonly referred to in the U.S. as the “Kano Model” (Violante & Vezzetti, 2017). Dr. Kano challenged the traditional ideal on customer satisfaction that “more is better”-that the better you perform on each product or service attribute, the more

satisfied the customers will be. Instead, Dr. Kano held that performance on product and service attributes is not equal in the eyes of the customers. Performance on certain categories of attributes produces higher levels of satisfaction than others (Zultner & Mazur, 2006). Professor Kano assumed that customer satisfaction was a non-linear function of product functionality consisting of three main components: must-be component, one-dimensional component, and attractive component. On this basis, he supposed that particular customer needs require different attention, which then affects the customer’s overall satisfaction (Madzik, 2016). Kano uses a questionnaire to classify requirements into categories. His questionnaire differs from standard surveys by giving a better picture of how the meeting/non-meeting of requirements affects the customer’s overall satisfaction. The Kano Model is considered a dynamic model because requirements which customers consider to be ‘attractive’ at one time gradually become ‘automatic’ (one-dimensional) (Hao & Li, 2010). The Kano Model is based on the assumption that high-quality products or services should meet all customers’ requirements, including latent ones, and not just those that they express directly (Shahin & Zairi, 2009).

Six Quality categories of Kano Model

According to Kano model, a customer’s attributes can be effectively categorized into six categories, described below (Gupta & Srivastava, 2011):

- **Must-be (basic) needs**
Meeting these needs often goes unnoticed by most customers, since customers expect these needs to be met by the product or service. In other words, these are often so basic that customers would not state them unless the service sector fails to perform them; but their absence is very dissatisfying. In other words, must-be quality, if not satisfied, almost always has great emotion associated with it. Basic factors should not be taken for granted, or regarded as easy to satisfy; some may even be exceptionally difficult to identify. Kano also refers to this as “taken for granted quality”. If you do not get the basics right, all else may fail. Therefore, service designers need to build up a list of must-be needs by drawing on their experience, observations and organized feedback (Shahin et al, 2103).
- **One-dimensional (performance) needs**
According to these requirements, customer satisfaction is proportional to the needs of the level-the higher the satisfaction level is, the higher the customer’s satisfaction is and vice versa. One-dimensional requirements-a clear customer’s requirements. As one possible example of this can be the waiting time at the bank (Gailevičiūtė, 2011).
- **Attractive (exciting) needs**
Customer satisfaction increases super linearly with increasing attribute performance. There is not, however, a corresponding decrease in criterion performance (Chen & Chuang, 2008).
- **Indifferent quality attributes**
The attributes in this category, whether present or not, will not affect satisfaction (He et al, 2015).
- **Reverse quality attributes**

When present, customers are dissatisfied and vice versa (Oh et al, 2012).

- Questionable quality attributes
 The customer may give ambivalent responses due to misunderstanding of the answers on the survey or filling out the error questionnaires (Hao & Li, 2010).

4. Results

A set of methods adopted to determine the requirements of customers that represent their needs and desires of the phenomenon is clear and precise in order to do this research, which is the basis for improving the project, and the methods that have been used direct interview with the customers and to identify precisely their needs that they want to be available in project (Basmaya Residential city),

As well as the focus of the focus group (clients) in the project, including the director of marketing and sales, as well as consulting people with expertise in the sale of apartments.

Based on the above, the relationship scheme was used to organize, classify and compile ideas according to each other's relationship and use the tree chart, which helped the technical focus group to understand these relationships and analyze the customer voice matrix in a very clear manner and divide the requirements into five main groups (Scheduling, cost, quality, safety, training and education). The totals are divided into sub-requirements of the Basmaya Residential Project, In order to help management focus on and improve basic requirements; Figure (1) shows the tree plan of the project (Basmaya residential city).

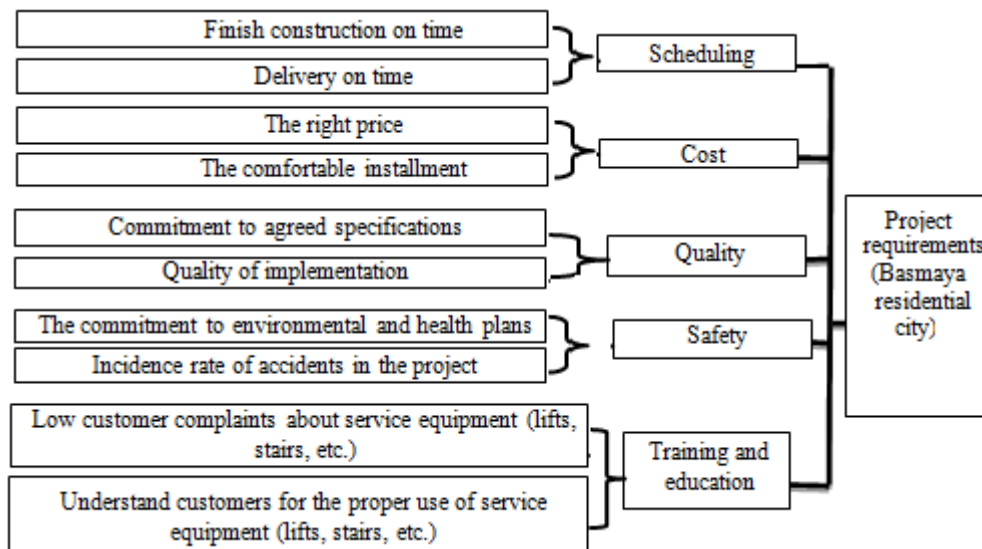


Figure 1: The tree plan of the project (Basmaya residential city)

According to the Kano questionnaire, customers' requirements are categorized according to the sample questionnaire, which consists of two questionnaires (functional and Dysfunctional).

The Kano questionnaire is processed and analyzed in order to classify customer requirements into quality characteristics (Kano) by means of the two questionnaires distributed to the study sample of (55) customers. Each questionnaire contains (10) requirements, Where the customer's opinions are taken from the study sample in the case of the requirement in the project (functional question) and if the requirement of the project (Dysfunctional question) is deleted, and it is answered by a scale ranging from 1. I like this requirement in the project ... 5. I do not like this requirement in the project (for the functional question) and 1. I like to delete this requirement from the project, 5. I do not like deleting this requirement from the project (for the Dysfunctional question), the customer answers 100%.

The customer answers (the sample of the study) are then linked to the questions (functional and Dysfunctional) based on the Kano evaluation table, According to the numbering in front of the responses of all customers (the sample of the study) and the requirements of customers are classified based on the opinion of the majority, For example, if the

response of the sample of the study sample (90%) of one of the requirements of the customers is the trait (attractive) and the other (10%) distributed among the other qualities (Must-be, One-dimensional, Indifferent, Reverse and Questionable quality attributes) Then classified the requirement of the customer within the qualities (attractive).

Based on the above, the researcher reviews the method of analyzing the Kano questionnaire according to the answer of one of the customers (the sample of the study) to classify the requirements of the customers to the qualities of quality (Kano) and two different cases of the customer's answers:

- As for the requirement (delivery on time), the answer to the function question was (1. I like having this requirement in the project). The Dysfunctional question was the customer's response (5. I do not like deleting this requirement from the project) Classifies the requirement into a one-dimensional attributes.
- As for the requirement (the right price), the answer to the function question was (1. This requirement must exist in the project). The Dysfunctional question was the customer's answer (5. I do not like deleting this requirement from the project) Classifies the requirement into a Must-be attributes.

Figure (2) shows the process of analyzing customer responses according to the Kano questionnaire, and so for the rest of the requirements of customers and for all members of the study sample.

Function question • What do you think if it is a requirement (Delivery on time, the right price) Found in a project (Basmaya residential city)?	1. I like having this requirement in the project. 2. This requirement must exist in the project. 3. I am neutral. 4. I do not oppose the existence of this requirement in the project. 5. I do not like this requirement in the project.	Functional and non-functional form of the Kano questionnaire
Dysfunction question • What do you think if a requirement is deleted (Delivery on time, the right price) in a project (Basmaya residential city)?	1. I like to delete this requirement from the project. 2. This requirement should be deleted from the project. 3. I am neutral. 4. I do not oppose deleting this requirement from the project. 5. I do not like deleting this requirement from the project.	

Customer requirements	Dysfunction question				
Function question	1.Like	2.Must-be	3. neutral	4.live with	5. dislike
1.Like	Q	A	A	A	O
2.Must-be	R	I	I	I	M
3. neutral	R	I	I	I	M
4.live with	R	I	I	I	M
5. dislike	R	R	R	R	Q

Kano Evaluation Table

Table of the classification of customer requirements to quality characteristics (KANO)

Customer requirements	A	M	O	R	Q	I	Total	Classification (Kano)
Finish construction on time			1					O
Delivery on time			1					O
The right price		1						M
The comfortable installment		1						M
Commitment to agreed specifications			1					O
Quality of implementation	1							A
The commitment to environmental and health plans			1					O
Incidence rate of accidents in the project			1					O
Low customer complaints about service equipment (lifts, stairs, etc.)			1					O
Understand customers for the proper use of service equipment (lifts, stairs, etc.)			1					O

Figure (2) Steps to classify customer requirements into quality attributes (Kano)

Source: Preparation of the researcher based on the response of the sample of the sample to the sample questionnaire (Kano). the responses of the sample of the study (customers), we obtain the classification of the requirements of the customers to the qualities of quality (Kano) according to the highest frequency of the attributes as shown in Table (1).

Following the completion of the data dump in the Kano evaluation table and based on the opinion of the majority of

Table 1: Analysis of the KANO model questionnaire for Basmaya city residential project according to the highest frequency

Seq.	Customer requirements	Attributes of Kano model					Total	Category		
		A	M	O	R	Q			I	
1	Scheduling	Finish construction on time	0	9	30	0	0	16	55	O
2		Delivery on time	1	12	28	0	0	14	55	O
3	Cost	The right price	0	36	12	0	1	6	55	M
4		The comfortable installment	2	25	22	0	1	5	55	M
5	Quality	Commitment to agreed specifications	3	17	30	0	1	4	55	O
6		Quality of implementation	1	19	31	1	0	3	55	O
7	Safety	The commitment to environmental and health plans	7	5	18	0	0	25	55	I
8		Incidence rate of accidents in the project	9	4	30	0	0	12	55	O
9	Training and education	Low customer complaints about service equipment (lifts, stairs, etc.)	10	7	29	0	0	9	55	O
10		Understand customers for the proper use of service equipment (lifts, stairs, etc.)	22	9	13	0	0	11	55	A

Source: Prepared by the researcher

The symbols in Table (1) refer to the following: -

Attributes symbol	Attractive	Must-be	One-dimensional	Reverse	Questionable	Indifferent
	A	M	O	R	Q	I

Table (2) shows the percentages of repeat customer responses (sample study).

Table 2: The percentages of repeat sample study to quality attributes (Kano).

Seq.	Customer requirements		Attributes of Kano model (%)						Total	Category
			A	M	O	R	Q	I		
1	Scheduling	Finish construction on time	0	16	55	0	0	29	100%	O
2		Delivery on time	2	22	51	0	0	25	100%	O
3	Cost	The right price	0	65	22	0	2	11	100%	M
4		The comfortable installment	4	45	40	0	2	9	100%	M
5	Quality	Commitment to agreed specifications	5	31	55	0	2	7	100%	O
6		Quality of implementation	2	35	56	2	0	5	100%	O
7	Safety	The commitment to environmental and health plans	13	9	33	0	0	45	100%	I
8		Incidence rate of accidents in the project	16	7	55	0	0	22	100%	O
9	Training and education	Low customer complaints about service equipment (lifts, stairs, etc.)	18	13	53	0	0	16	100%	O
10		Understand customers for the proper use of service equipment (lifts, stairs, etc.)	40	16	24	0	0	20	100%	A

Source: Prepared by the researcher

Table (2) shows the results of the Kano questionnaire according to customer responses (study sample) the results indicate the classification of requirements (the right price and convenient installment) within the Must-be attributes. For the Basmaya residential project by percentage (65% and 45%) respectively. Therefore, the project management should provide these requirements when building the apartments in order to win the satisfaction of customers and attract them to buy these apartments because failure to provide these requirements leads to the dissatisfaction of customers and therefore not to buy the residential apartment, and these prerequisites to strengthen the competitive position of the project in the market.

As for requirements, (Finish construction on time, Delivery on time, Commitment to agreed specifications, Quality of implementation, Incidence rate of accidents in the project, Low customer complaints about service equipment) They are categorized into one-dimensional attributes by percentage (55%, 51%, 55%, 56%, 55%, 53%) respectively. Where they are expected to be met because these requirements are directly requested by customers and commensurate with their level of satisfaction with the extent to which these requirements meet their needs. If satisfied, customers will be satisfied and vice versa. In order to win customer satisfaction and encourage them to buy apartments as well as superiority over competitors in the market.

The requirement has classified (Understand customers for the proper use of service equipment) to attractive attributes by percentage (40%), This is the most important effect on customer satisfaction and is characterized by the fact that it causes happiness and joy to customers, and that their achievement leads to increased customer satisfaction and non-achievement does not lead to resentment of customers, and the project should provide this feature in order to attract more customers.

Finally categorize the requirement (The commitment to environmental and health plans) within Indifferent Attributes by percentage (45%), this is considered ineffective at the level of customer satisfaction or dissatisfaction with the project, and customers are indifferent to the existence or lack of this requirement in the project.

We notice above apply the Kano model questionnaire. He contributed to the classification of customer requirements into four attributes (Must-be attributes, one-dimensional attributes, attractive attributes, Indifferent attributes). According to customer opinions (sample study) and Not showing up attributes (Reverse attributes, Questionable attributes).

5. Recommendations

- 1) Accurate identification of customers' needs through listening to customer voice in different ways, such as personal interviews and technical focus groups.
- 2) Use the Kano model as a modern tool in classifying customer needs and accurately defining requirements there.
- 3) Direct the project management to achieve the basic characteristics of the project in order to ensure the loyalty of customers and enhance the competitive position of the project in the market. Emphasis should also be placed on the achievement of one-dimensional qualities as it also contributes to increasing customer satisfaction and thus achieving superiority over the competing project. Providing attractive qualities in the project leads to the satisfaction of customers and attract more of them to this project management should pay attention to provide good specifications and high quality implementation and the price is appropriate to maintain customer satisfaction.

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