Kano Model

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Abstract: In recent years researches in the field of quality management headed towards new theories on quality. This paper concerns the assessment of customer satisfaction to the theory of attractive quality - Kano model and related issues (information, involvement, customer inquiries). Arguments are made on knowledge and application of Kano model and its variants in order to improve quality in healthcare system.

Keywords: customer satisfaction, service quality, healthcare service, Kano model

Introduction

To be successful, an organization should focus its efforts primarily to the collection, knowledge, understanding and meeting requirements, needs and expectations of all its internal, external, current and potential customers.

Later on, after supplying the product / service that meets - more or less - these requirements, needs and expectations, the organizations should determine and use the most appropriate techniques, methods and tools for evaluating the satisfaction of their clients in order to obtain customer loyalty, an improved intern and extern relational system and in order to establish and maintain partnership relations with loyal customers.

Furthermore, organizations that want to be efficient should adopt and demonstrate a clear customer and quality orientation, especially trough a continuous evaluation of their customers’ satisfaction and through a permanent assessment of the achieved performances. These issues are also requirements of the quality management system according to ISO 9000.

Basically, it was found out that a client-oriented organization is able to predict the evolution of attitudes and behaviors of its customers and thus better satisfy all their requirements, needs and expectations. Knowing in advance what means "value for the customer", collecting and analyzing relevant data and information on the quality perceived by customers and their requirements, needs and expectations, but also continuously and dynamically adopting methodologies corresponding to the customers requirements, the organizations become capable to develop and maintain long-term relationships with their customers and generate benefits for all stakeholders.

Addressing quality health care system is complex. In recent decades, medicine based upon evidences and clinical practice guides, professional development, assessment and accountability, empowerment / patient empowerment and total quality management has gained popularity.

1. Service Quality and Customer Satisfaction

Service quality and customer satisfaction have been recognized as key antecedents of customer loyalty [6] [20] [4] [29]. Continuous quality improvement of health services should be the focus of any organization. They must be based on customer perceptions of service quality in order to identify the strengths and / or weaknesses and appropriate design strategies.

Even if preventive medicine is successful, some people will probably be sick in their lifetime. Therefore, they need medicines, curative treatment in hospital. Quality of health care, time
management, in response to expectations of patients, malpractice prevention, and treatment update are very important. The Institute of Medicine of Washington defined quality as "the degree to which health services for individuals and populations increase the likelihood of health desired outcomes and are consistent with current professional knowledge" and described six dimensions of quality care: a care that is safe, effective, patient centered, timely, efficient, and equitable [13].

Strategic significance of customer satisfaction in the health care sector, including hospital services, is different from other service areas due to gaps / differences between perceptions and expectations [18]. Matzler et al. (2004) [12] noted the need for the use and evaluation of satisfaction as an indicator of services performance and therefore an indicator of the future of the organization because services quality is a vital element in creating customers’ satisfaction. Even though preventive medicine is successful, some people will be ill during their lives. As a consequence, they will need curative medicine or hospital treatment. The health care services provided by doctors, nurses and other health workers in hospitals have to be managed in efficient and effective way. The health service quality, time management, response to patients' expectations, prevention from malpractice, updated treatment and so on, are very important in hospitals while giving health services. Strategic significance of customers’ satisfaction has been realized by healthcare business including the hospital services like in the case of the other services sectors in recent years. To fill the gaps between customers’ perceptions and expectations about the service received is vital for customers’ satisfaction. As Matzler et al. (2004) stated, more and more organization use satisfaction rating as an indicator of the performance for services and consequently an indicator of the organization's future. So, service quality is a vital element in creating customer satisfaction.

Service quality and customer satisfaction can be improved by managing performance and attributes/ characteristics of the service. In this context we choose for the use of term of attribute of quality, because as in the case of services, we refer mainly to the qualitative characteristics and not to the quantitative ones [18]. Because not all attributes have the same role in customers’ satisfaction, it is important to learn how the impact of their performance has on customers’ satisfaction. This means that an organization should assess the importance of customer service attributes and evaluate the current performance of these attributes in order to plan quality improvement. Patients often have little previous expectations of a medical service before their first visit to the hospital which is primarily based on gathering information indirectly, sometimes subjective, coming from friends and family recommendations when choosing a hospital or doctor [32]. Available information from suppliers or other environments are often too highly technical and are not useful for forming initial impressions and decision-making.

The aim of the research was to track quality improvement with a focus on customer relationship management (CRM), on strategies and the relationship between service attributes and customers’ satisfaction through Kano's model, especially with respect to healthcare service in hospital.

2. Theory of Attractive Quality. The Kano Model

In the country that experienced the "quality miracle", the Japanese Kano developed the theory of attractive quality - Kano model. This theory was aimed at a better understanding of how customers evolve, evaluate and perceive quality attributes and focused the attention on the attributes considered more important by customers in order to improve them.

Kano model explains how the differences that separate the degree called sufficient by that of excellent when considering the customer’s satisfaction. The theory of attractive quality considers that quality attributes are dynamic, which means that over time, a feature may change from satisfactory to unsatisfactory [5]. Studies in the literature led us to the conclusion that the application of Kano model is important for:

- Designing products and services;
- Manufacturing / delivering of services;
- Analyzing the characteristics of the product / service;
- Determining customer satisfaction;
- Continuous improvement of quality.
This model states that satisfaction and dissatisfaction are two independent concepts in the mind of the consumer and should be considered separately. Kano et al. (1984) [5] concluded that the relationship between performance of a need and satisfaction or dissatisfaction as experience is not necessarily linear.

The Kano model brings a different perspective in order to analyze the possibilities of improving the quality of products and services, just because it takes into account the nonlinear relationship between performance and satisfaction. The Kano model classifies the quality attributes into three categories [4]:

1. **Must-be Attributes.** These attributes correspond to the basic requirements of the quality of a product. If they are not present or their performance is poor, customers will be extremely dissatisfied. On the other hand, if they are present or have sufficient performance, they do not bring satisfaction.

2. **Performance attributes.** Regarding these attributes, satisfaction is proportional to the level of performance. Usually, customers require explicitly performance attributes.

3. **Attractive attributes.** These attributes are key to customer satisfaction. If they are present or have sufficient performance, they will bring higher satisfaction. On the other hand, if they are not present or their performance is poor, customers will be dissatisfied. These attributes are neither required nor expected by customers.

Other two attributes can be identified in the Kano model: *neutral attributes* and *reverse attributes*. Neutral attributes do not affect satisfaction or dissatisfaction. Reverse attributes bring more satisfaction if they are absent. A representation of the Kano model was suggested by Hogstrom et al. (2010) [4], Figure no. 1.

![Kano model](image)

**Figure no. 1 Kano model (Hogstrom et al., 2010)**

The advantages of the product / service features classification as attractive, necessity and performance ones are as follows [12] [31] [28]:

- Product quality characteristics are better understood and specified but those which have the greatest influence on customer satisfaction;
- Discovering and fulfilling attractive features creates a wide range of possibilities for differentiation. A product that meets the needs and is performing can only be perceived as an environment and therefore interchangeable.
- You can set priorities for product development. It is, for example, no need to invest in improving necessities if they are already at a satisfactory level. It is better to improve performance or quality attractive, as it has a greater influence on customer satisfaction.
To build a higher value level the customer wants not only basic needs and performance satisfaction, they also need attractive quality to satisfy their "emotional needs", so the client must have something extra and unexpected [15].

Kano's model is widely accepted in the research [21], [15], [31], [10], [14], [8], [23], [25] and has been integrated with other management quality instruments: Tan & Shen (2000) [26] propose integrating Kano model with QFD, Shahin [22] proposes integrating Kano model with FMEA, Pugna et al [19] propose Kano model as three-dimensional in order to assess quality.

An interesting solution, from our point of view, is to apply the theory of attractive quality to the employees of a medical unit. Employees’ satisfaction has become one of the critical issues in total quality management. It was found that employees’ satisfaction improves productivity and customer satisfaction. Kano model distinguishes three categories of factors having a different impact on employees’ satisfaction formation: basic factors (dissatisfaction), emotional factors (satisfaction) and performance factors (hybrid factors). Rubin [21] and York [32] found an asymmetric relationship between satisfaction with various factors and the employees’ satisfaction in general, confirming thus Kano’s model.

3. Improved Versions of Kano Model

Refined Kano Model
Kano model with five categories of quality attributes - attractive, one-dimensional mandatory indifferent and reverse - is widely used in industry and research. However, the model has a defect that prevents organizations to accurately assess quality attributes taking into account the degree of importance given to certain items as customers. Kano's model was improved.

Based on Kano model, Yang [31] developed a refined Kano model that increases the importance of quality attributes switching from four categories of quality attributes to eight categories: very attractive - less attractive, high value added - low added value, critical - required and potential - indifferent as shown in Figure 2 [28].

![Figure no. 2 The Refined Kano model (Yeh, 2010)](image)

The indifferent quality attributes can therefore be classed as carefree or potential, depending on their degree of importance. Table 1 lists the redefined categories of quality attributes obtained by refining
Kano’s model. In Figure no. 2, curves are used to illustrate the means of the redefinitions of quality attributes.

Table no. 1 Categories of quality attributes in unrefined and refined Kano’s model

<table>
<thead>
<tr>
<th>Categories of quality attributes in Kano’s model</th>
<th>Categories of quality attributes with high importance in refined model</th>
<th>Categories of quality attributes with low importance in refined model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attractive</td>
<td>Highly attractive</td>
<td>Less attractive</td>
</tr>
<tr>
<td>One-dimensional</td>
<td>High value-added</td>
<td>Low value-added</td>
</tr>
<tr>
<td>Must be</td>
<td>Critical</td>
<td>Necessary</td>
</tr>
<tr>
<td>Indifferent</td>
<td>Potential</td>
<td>Care-free</td>
</tr>
</tbody>
</table>

The Importance of the satisfaction model

The above discussion leads to the development of a model referred to as the importance–satisfaction model (I–S Model) [31]. This is illustrated in Figure 3. In this model, the horizontal dimension shows the degree of importance of a quality attribute, and the vertical dimension shows the satisfaction level of the quality attribute. The order pair (importance scale, satisfaction scale) can then be located on the coordinates. The means of the importance scale and the satisfaction scale can be used to divide the coordinate into four areas, as follows:

I. Excellent area: The attributes located in this area are those that customers considered to be important, and for which the performance is satisfactory to customers. Retention of customers requires that performance in these attributes be continued.

II. To be improved area: The quality attributes listed in this area are those considered as important to customers but for which the performances have not met with expectation. The company must focus on these attributes and make improvements immediately.

III. Surplus area: The attributes listed in this area are not very important to customers, but the perceptions of customers are quite satisfactory. The company can put these quality attributes aside. If the company needs to cut costs, these are the attributes that can be eliminated without incurring a significant negative impact on the customer satisfaction.

IV. Care-free area: These quality attributes are those about which customers have a lower satisfaction level, but which they also rank as being less important. The company does not need to worry about these attributes, because these items have less impact on the whole quality-evaluation process.

Even though this importance–satisfaction model is a simple structure, it can nevertheless provide much useful information about a company’s quality performance.

The IPA-Kano model

The IPA-Kano model is a new tool for diagnosing skills and attributes of service quality attributes providing specific strategies for each category [8]. The IPA-Kano model avoids the limitations of
Kano model regarding the neglecting of the *importance of attribute performance* (IPA) and eliminates its weaknesses.

**The CKM-Kano Model**
Customer relationship management (CRM) is an information-technology-enabling management tool, which manages the relationship with customers to understand, target, and attract them, with the objective of satisfying and retaining customers. Their synergy potential draws attention and has led to the emergence of the customer knowledge management (CKM). In a knowledge management domain, an important task is the conversion of tacit knowledge into explicit knowledge, whereby the well-established Kano's Method has come up to demand and extract customer knowledge for attractive quality creation in new product development projects. As a consequence, Kano-CKM model with a methodology to delineate precisely the process of customer knowledge discovery for innovative product development [1].

**The Kano – QFD model**
The quality of a product or service is ultimately judged in terms of customer satisfaction. Focusing on listening to the voice of the customer (VoC), quality function deployment (QFD) has been used as a quality improvement and product development technique in many fields. To achieve total customer satisfaction in an effective way, QFD practitioners should go beyond merely listening to the VoC. Tan & Shen (2000) presents an integrative approach by incorporating Kano's model into the planning matrix of QFD to help accurately and deeply understand the nature of the VoC. Based on the Kano model analysis, an approximate transformation function is proposed to adjust the improvement of each customer attribute. Customers' raw priorities are thereby adjusted accordingly for achieving the desired customer satisfaction performances [2].

QFD and the Kano model can be integrated effectively to identify customer needs more specifically and to yield maximum customer satisfaction [26][27]. By using the Kano model and integrating it in the QFD, the design team can understand the need of customers in a better way and can properly focus on it.

**Kano’s three-dimensional model for quality evaluation**
Combining quality, as expressed in the Kano model, with the synergistic effect of TRIZ and Taguchi methods lead to a three-dimensional model of quality. The third dimension added to the quality by the synergistic effect of TRIZ and Taguchi methods, allows the exploration, improvement and optimization of technological solutions for each type of quality described by Kano model [19].

4. **Patients’ Implication in Improving Health Care Quality**
Patients’ health care quality is given by:
- Patient care when needed and as needed;
- Fairness of quality service from care;
- Temporal coordination between the patient and the health service providing health environment.

In recent years with the concept of client underwent a shift from "a recipient of a service" to "one who actively participates in the creation of value" [6] or "actor creates value" [5], though remaining "heart quality system" [11]. Traditionally, the patient was described as weak, exposed and dependent of the care environment or seen as an object in medical discourse [16]. Physical comfort and pleasant reception will reduce patient’s dissatisfaction, but the real value creation can not be achieved without a well accepted and established dialogue relationship between patient and physician / nurse and by a sense of trust in the relationship. It is essential to focus on understanding the processes that create value for customers in terms of patients. Value is created in the interaction between supplier and customer. The concept of productivity in services in health care should include values such as concern for the health, quality of life, reduce waiting times and accessibility, trust, information, avoid suffering [16], [23]. Currently patient involvement is very unlikely. One issue is the lack of information. It is necessary that this involvement be prepared, supported and then appropriately capitalized.

Instead of talking about activities, the concept of service productivity in health care should encompass values like experienced health, quality of life, reduced waiting time and accessibility, trust,
information, avoidable suffering and avoidable deaths. An overall aim should be to create value by complementing, supporting and matching the value creation process of the customer (patient). Within the practical field a possible support system for how health care services could be integrated fitting the value creation process of the customer (patient) is lacking. In light of the identified inadequacies, it should be a matter of interest to outline a support system for harmonizing capacity between providers and organizing ways of match making competence fitting the customers (Nordgren, 2009).

Among the weaknesses of the health system there can be included the knowledge and the rights respect, patients’ information and the waiting time for treatment. Euro Health Consumer Index (EHCI) has become since 2005 the standard for assessing European healthcare systems. The 2012 issue [36] classified 34 national health systems in Europe on the basis of 42 indicators covering five key areas of health: patient rights and information, waiting time for treatment, outcomes, prevention or scope and coverage services provided and pharmaceuticals. Unfortunately, Romania has obtained 489 out of 1000 possible points being ranked 32, followed by Bulgaria and Serbia. Holland was nominated for the third consecutive time, as the country with the most advanced medical system in the 27 EU countries. The performers’ top is completed by Denmark and Iceland.

The Romanian patients are among the least informed in Europe, says report "Empowerment of the European Patient - Options and Implications" [34]. Information is an important first step, "literacy" of patients about their rights being essential for them to actually become active in the health system. Study on health systems perspective "HCP 2020" [37] shows that we should not expect "society" to take care of health system weaknesses, but to prepare for the actions of patients, consumers and stakeholders to form future.

The same study suggests there is a strong perceived relation between on one side access to information about your illness and on the other the standard of treatment; three out of four said that better information would improve the care given. Europeans clearly look upon healthcare information as an asset improving quality of life.

These are not the first pieces of research giving evidence to such health consumer empowerment values nor will they be the last. Healthcare needs to change and will fundamentally change as we grow to become more and more global and aware of new options and realities. Such forecasts were made by the study The European Patient of the Future. HCP noticed similar trends in its own “2020 survey”.

Conclusions
From our study we draw the following conclusions:

- The relationship with the client in healthcare and hospital management should be improved.
- It is necessary to design, completion and improvement of quality assessment methodology of attractive and emotional perception to measure customer satisfaction through improved customer information.
- New patient must have quality health care culture. Quality culture should determine a balance between qualities attributes.
- TQM implementation should be based on an integrated information system, directed to health care, in which clinical research and education are split into three sectors: health clinics, administrative and operational decision making.
- The scientific papers in recent years encourage research in the field of quality management towards theories regarding attractive quality and related fields.

The application of Kano model to health services is further on complicated by the fact that choices and performances may be extremely limited, primarily due to lack of information, but due to the limitation of health insurance, which constrain patient and / or physician choice. The complexity of patient perceptions and attitudes together with the cognitive ability, sometimes limited in the process of decision regarding the urgent attributes of health that concerns the patient. Expectations and preferences are also shaped by a variety of inputs, such as personal experiences, family members and friends, physician and patient-directed advertising campaigns.
Our study may encourage hospital management to use Kano analysis as an advanced approach for measuring satisfaction / dissatisfaction, even before the development and launch of new services / products, compared to polls that you normally use.

References


