



Kano qualitative vs quantitative approaches: An assessment framework for products attributes analysis



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ABSTRACT

The Kano model distinguishes the different relationships between Customer Requirements fulfillment and Customer Satisfaction, especially the nonlinear relationships. However, the model only emphasizes on the classification method and the qualitative descriptions of various relationship curves. Based on the understanding of the traditional Kano model, different approaches have been proposed to extend the Kano model from qualitative descriptions to quantitative analysis to understand customer needs in a more accurate manner. However, the results of these quantitative methods are mixed and no consensus has emerged on the most appropriate and general purpose approach.

The present study describes strengths and weaknesses of qualitative and quantitative Kano approaches (such as Fuzzy, Continuous Fuzzy, Analytical Kano models) and proposes an assessment framework that identifies the relationships between approaches and classification requirements in order to help to select the most suitable methodology for analysing the most successful product and service quality attributes affecting the customer satisfaction.

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1. Introduction

Every organization makes an effort to increase Customer Satisfaction by improving their products or services, but they are constrained by limited resource. Hence, determining the most suitable way to allocate scarce resources is crucial to achieve the highest level of Customer Satisfaction. Since the attributes of a product/service do not play the same role in satisfying the customers' needs, identifying the critical factors that determine satisfaction is essential to the sustained success of any organization [1]. Ever since its introduction in the 1980s, the Kano two-dimensional model has become one of the most popular quality models among marketing/management practitioners and researchers in a wide range of industries [2–7]. The Kano model abandons a strictly linear view of the impact of product/service attribute-performance on Customer Satisfaction. It permits to identify the particular attributes that have the potential to elicit Customer Satisfaction/delight and/or Dissatisfaction/frustration [8].

The Kano model recognizes the diverse relationships between Customer Requirements (CRs) fulfilment and Customer Satisfaction, especially the nonlinear relationships.

However, the model only focuses on the classification method and on the qualitative descriptions of various relationship curves. Limited quantitative analysis or measurement of the relationships is discussed in the traditional Kano model. The Kano qualitative categories could not precisely reflect the extent to which the customers are satisfied. The Kano model in fact lacks a quantitative measurement of Customer Satisfaction. These limitations make it fall short to play a key decision-making role in product innovation and service management. Therefore, the problem that arises is how to identify possible improvements to Kano original model, so that quantitative analysis can be developed to measure the various relationships between Customer Satisfaction and CRs fulfilment.

Based on the understanding of the original model, different approaches have been proposed to extend the Kano model from qualitative descriptions to quantitative analysis to understand customer needs in a more accurate manner [9–18]. Various conceptual approaches have been suggested for classifying quality attributes in the model, such as Fuzzy Kano model, Analytical Kano model, Regression Analysis with the Kano model and so on. In most parts of these approaches, the Kano model is employed as a starting point of the proposed quantitative analysis, which involves conducting preliminary study, developing and administrating the

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Kano questionnaire, as well as analyzing questionnaire results to identify Kano categories for each CRs. After obtaining the classification results, each approach proposes coefficients, models, or functions to quantify the Kano model.

However, the results of these quantitative methods are mixed and no consensus has emerged on the most appropriate approach. The purpose of the present study is, therefore, to build a systematic framework on the findings of these empirical studies with the aims to: provide researchers and managers with guidance for choosing and applying the most appropriate approach for their needs; support researchers in the development of new ideas; help potential users to better understand the concepts behind the selected quantitative methods. Our research in the literature has found that very few comparisons between the refinements of the Kano model have been carried out till now. Also, above all there is a gap in the benchmarking of the quantitative approaches of the Kano model [13,19,20].

In pursuing this objective, first the present study takes into consideration all refinements and quantitative approaches of the Kano models available in literature, highlighting strengths and weaknesses of each technique. Then, the study develops a comparative framework that, on the basis of different classification requirements, allows the user to choose the most appropriate approach to classify the attributes of a product or a service.

The remainder of the paper is organized as follows. The qualitative method is presented in section 2. The quantitative approaches are then examined in Section 3. Section 4 presents the structure of the comparative framework. The paper concludes with a discussion of the main findings in Section 5.

2. Qualitative approaches

This section deals with the qualitative forms of the Kano model. In particular, it presents the traditional and original Kano model

Table 1
Overall comparison between qualitative Kano models.

Criteria	Weaknesses	Strengths	Referred published studies	Model
Typology of assessment	It considers qualitative assessment It considers crisp descriptions	It considers non-linear relationship	Kano et al. [8] Anderson and Mittal [21]	Kano model
Classification criterion	It does not distinguish attributes within the same category It adopts a statistic mode as classification criterion, which may suffer from a discontinuity problem	It can be applied not only to new product development but also to new service creation It has no technical limitations regarding the number of attributes to be analyzed	Lin et al. [16]	
Questionnaire	The Kano model is constructed through a customer questionnaire. It can be time-consuming and potentially expensive (especially if travelling is required to interview customers, if there are a large number of interviews, etc.) It uses single answer or certain answer range through customer questionnaire	The Kano model does not require experienced customers with the attributes that are being classified	Fynes & De Burca [22] Matzler & Sauerwein [23] Ting & Chen [24] Riviere et al. [25] Matzler & Hinterhuber [26] Bhattacharyya & Rahman [27] Mikulic & Prebezac [19] Nilsson-Witell & Fundin [28] Raharjo [29] Violante & Vezzetti [5] Violante et al. [7] Violante & Vezzetti [6]	
Typology of assessment		It is a two-step classification to distinguish between categories to a greater degree. Specifically, subcategories can be formed from the various Kano categories	Shen et al. [3]	Force-choice classification
Classification criterion	There can be reliability problems with the understanding of the approach in the cases when the researcher does not well explain the theory and/or the respondents do not understand it well Explaining the theory to respondents can be time-consuming Categorizing attributes into “attractive”, “must-be”, and “one-dimensional” category firstly	It does not rely on an indirect assessment of the various Kano categories on the basis of implicit assumptions	Mikulic & Prebezac [19]	

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