Making Old ‘New’ Again: Prioritizing Medical Device Features Using Kano Model Analysis

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Imagine designing a new patient monitor to be launched by a medical device manufacturer for use in hospitals around the world. One first must set priorities among potential product specifications in order to launch a monitor that resonates the most with customer preferences. It is crucial to design a monitor with the right mix of features, particularly the ones that will ultimately convince the customer to purchase the product. In addition, in order to command a premium, one must include features that delight customers and give the product an edge over the competition.

Making Feature Decisions

Medical device product development teams are often asked to develop new features for new devices or updated generations of existing devices. Often, due to cost or resource restrictions, a decision needs to be made between including one feature versus another. Rather than playing a guessing game about the mix of features, the teams often turn to market research to gather a better understanding of the needs of the target customer. Understanding what makes a difference to target customers is typically one of the steps on the path to designing an optimal product.

What is Kano?

Kano is a quantitative methodology that works by showing a series of features to customers, one by one. It does so by asking customers to answer two questions per feature.

- Functional question: How would you feel if the new patient monitor offered [insert feature] as part of its design?
- Dysfunctional question: How would you feel if the new patient monitor did NOT offer [insert feature] as part of its design?

For both questions, respondents are asked to select one of the following answers:

- It would excite me to have it that way
- I would require it to be that way
- It does not matter to me if it were that way or not
- I wouldn’t like it, but could live with it that way
- I would not accept it to be that way

By asking the two questions for each feature, a code frame is then used to map the list of features or specifications into buckets to understand the preferences, including "must have" features, "must not have" features, and features that will delight or excite the customer.

Kano Model Analysis is a helpful market research technique to support product development challenges like these. It allows for the evaluation of certain aspects of a product or concept one by one, and helps set priorities among the potential product specifications. With Kano, one can identify not only the "must have" and "must not have" features, but also the "delighters" that differentiate the product competitively and help to command a premium (see sidebar).

One result of Kano is a framework that identifies features that fall into the following categories:

- Must Have: These are critical to have or "table stakes" to customers evaluating the product.
- Dissatisfier or Must Not Have: These would turn people off and drive them away if it were to remain.
- Yield Indifference: These produce a "who cares?" reaction if the feature is there or not.
- Are Exciting: These provide unexpected excitement and satisfaction, also known as the "wow" factor. These features have the potential to delight the customer.

Each feature is evaluated in terms of its potential contribution to future product success. When designing a product, the goal is to have a mix of "Exciting" and "Must Have" features, avoiding features that cause indifference or drive prospects away. Doing this requires a heuristic from which to base decision making. For instance, one may decide to include all the features that cross a threshold value in the "Must Have" framework and to include the delighters, while excluding all the features that cross the threshold value in the "Must Not Have" framework.

Kano with a Twist

The Kano classification provides overall information about how many respondents "Must Have" or "Must Not Have" certain features in the device. However, it does not quantify how strongly they feel about these choices. Historically, Kano was paired with rating or ranking exercises that aimed to measure the strength of respondents' reactions. However, due to scale characteristics and use, neither ratings nor ranking produce sufficient discrimination to help us determine which features help set the product apart.

Kano classification	Feature A	Feature B
Must have	32.5%	27.5%
Must not have	15.0%	10.0%
Indifferent	20.5%	28.5%
Exciter / delighter	32.0%	34.0%

The integration of Choice-Based Conjoint (CBC) into Kano solves this inherent shortcoming. Conjoint analysis is a statistical technique used in market research to determine how people value features that make up a product or service by determining the influence of the features on the choices customers make. CBC lets the customer express preferences by choosing from sets of products composed of feature combinations. The choice-based task is similar to what buyers do in the marketplace. The experimental nature of CBC allows researchers to see how strongly—either positively or negatively—consumers prefer a feature.

A hypothetical A/B evaluation of preferences produced using CBC illustrates how it can deepen the Kano generated information (Table 1).

A heuristic is needed to decide which feature to include. One may choose to include a feature if it contributes to satisfaction, looking at the "Must Have" and "Must Not Have" metrics. Feature A is a "Must Have" to 32.5% and feature B is a "Must Have" to 27.5%. If the feature is not included, one can assume that those customers will not purchase the product. However, feature A is "Must Not Have" to 15% and feature B is a "Must Not Have" to 10%. Including these features will result in dissatisfaction that may result in a stalled purchase. Both features A and B help to gain some and lose some. To solve this quandary, one can examine at the excitement levels: 32% for feature A and 34% for feature B. Again, they are not meaningfully different. The results are not clear cut, and additional information delivered by CBC would be incredibly useful. Because respondents were asked to complete a CBC exercise and therefore provide the associated preference levels, one has access to enhanced insight (Table 2).

CBC-based preference	Feature A	Feature B
Prefers to have it (presence, 0 to 100%)	45.0%	34.0%
Prefers not to have it (absence, 0 to 100%)	12.0%	22.0%
Net preference	**33.0%**	**12.0%**

Feature preference values are derived from the choices that respondents make during the study. Some respondents prefer the presence of the feature; others prefer its absence. Both get their own preference value, which are combined to create net preference values. The net preference values (33% over 12%) give one reason to believe that feature A creates more excitement and commands more opportunity to ask a premium than feature B.

The end result is the ability to identify potential product features by their associated importance and worth. For example, "Must Have" features are features that need to be included in the design of a product; otherwise, there is the risk of driving customers away. "Delighters" or "exciters" are features that may command a premium as they add value to the customer. Product development teams can use this information to intelligently scope their products to achieve maximum business potential. This information can be critical for teams faced with the need to prune product specifications to maximum business potential while minimizing costs.

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