



The asymmetric relationship between attribute-level performance and overall customer satisfaction: a reconsideration of the importance–performance analysis

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Abstract

The importance–performance analysis (IPA) is a widely used analytical technique that yields prescriptions for the management of customer satisfaction. IPA is a two-dimensional grid based on customer-perceived importance of quality attributes and attribute performance. Depending on the interplay of these two dimensions, strategies for satisfaction management can be derived. As theoretical and empirical work has shown, the relationship between attribute-level performance and overall satisfaction is asymmetric. These findings call into question the applicability of IPA. In this paper, an empirical study on customer satisfaction with a supplier in the automotive industry was undertaken. Using a regression analysis with dummy variables, the asymmetric relationship between attribute-level performance and overall satisfaction could be confirmed. Furthermore, it is shown empirically that the managerial implications derived from an IPA are misleading. Consequently, the traditional IPA needs to be revised.

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1. Introduction

Without question, quality and customer satisfaction are key drivers of financial performance. It is argued that satisfaction leads to increased loyalty, reduced price elasticity, increased cross-buying, and positive word of mouth. Numerous empirical studies confirm a positive relationship between customer satisfaction and profitability (e.g., Anderson, Fornell, & Lehmann, 1994; Eklöf, Hackl, & Westlund, 1999; Ittner & Larcker, 1998).

In industrial markets, the importance of assessing and managing customer satisfaction is widely recognized (e.g., Tikkanen, Alajoutsijärvi, & Tähtinen, 2000). It is crucial to identify the critical factors that determine satisfaction and loyalty. Each company, however, is constrained by limitations on the resources they have available. Therefore, it must be decided how scarce resources are best deployed to achieve the highest level of satisfaction. An effective method to set priorities is importance–performance analysis (IPA). It analyses quality attributes on two dimensions: their performance level (satisfaction) and their importance to the customer. Evaluations of attributes on these two dimensions then are combined into a matrix that allows a firm to identify key drivers of satisfaction, to formulate improvement priorities, and to find areas of possible overkill and areas of “acceptable” disadvantages. In practice, IPA is considered a simple but effective tool (e.g., Hansen & Bush, 1999). It is very helpful in deciding how to best allocate scarce resources in order to maximize satisfaction.

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Two implicit assumptions underlie the IPA: (1) Attribute performance and attribute importance are two independent variables. (2) The relationship between quality attribute performance and overall performance is linear and symmetric.

Research in customer satisfaction, however, suggests that quality attributes fall into three categories: basic factors, performance factors, and excitement factors (Anderson & Mittal, 2000; Gale, 1994; Johnston, 1995; Matzler & Hinterhuber, 1998; Matzler, Hinterhuber, Bailom, & Sauerwein, 1996; Oliver, 1997). In Kano's (1984) model of customer satisfaction, the relationship between performance and importance of basic and excitement factors is nonlinear and asymmetric. Furthermore, attribute importance can be interpreted as a function of performance. Basic factors are critical when performance is low. Their influence on overall satisfaction decreases when performance increases. The opposite is true for excitement factors. They become important determinants of satisfaction when performance is high but play an unimportant role when performance is low. Thus, Kano's model of customer satisfaction disconfirms the basic assumptions of IPA and calls into question its managerial implications. The purpose of this paper is twofold. First, using data from a customer satisfaction survey, it is intended to confirm Kano's model of customer satisfaction empirically. A regression analysis with dummy variables is used to assess the asymmetric relationship between attribute-level performance and overall satisfaction. These results then are used to demonstrate that the traditional IPA is misleading and that it needs to be revised.

In the following sections, IPA and Kano's (1984) model of customer satisfaction are described briefly. Then, the results of the empirical study are presented. In the final section of the paper managerial implications of the findings are discussed.

2. Importance–performance analysis

IPA, originally introduced by Martilla and James (1977), yields insights into which product or service attributes a firm should focus on to achieve customer satisfaction. Typically, data from satisfaction surveys are used to construct a two-dimensional matrix, where importance is depicted along the *x*-axis and performance (satisfaction) along the *y*-axes. Customers are asked to rate each attribute on its performance. Attribute importance is measured using some form of self-stated importance (e.g., rating scales, constant sums scales, etc.) or derived importance (multiple regression weights). The means of performance and importance divide the matrix into four quadrants. The following recommendations for customer satisfaction management emerge (see Fig. 1).

Attributes in Quadrant I, evaluated high in both satisfaction and importance, represent opportunities for gaining or

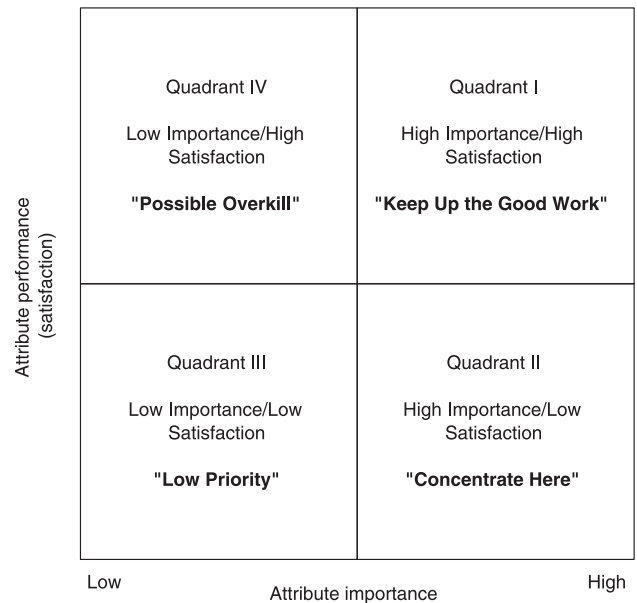


Fig. 1. Importance–performance analysis (IPA).

sustaining competitive advantage. In this area a firm should “keep up the good work.” Low satisfaction on highly important attributes demand immediate attention (Quadrant II). To enhance overall satisfaction, a firm should concentrate on these attributes. Ignorance of these attributes poses a serious threat to the firm. Quadrant III contains attributes both low in satisfaction and importance. It is not necessary to focus additional effort here. These product or service attributes are of “low priority.” Attributes located in Quadrant IV are rated high in satisfaction but low in importance. This implies that resources committed to these attributes would be better employed elsewhere. High performance on unimportant attributes indicates a “possible overkill.”

The IPA has been used in a variety of settings (e.g., Sampson & Showalter, 1999). In literature, some modifications and extensions have been presented. Yavas and Shemwell (1997), for instance, suggest including competitor's performance and attribute salience to extend the analysis. In principle, however, the underlying assumptions have remained the same. Attribute importance and performance are the key decision factors. They are thought to be independent and it is assumed that the relationship between attribute-level performance and overall satisfaction is linear and symmetric. There is growing evidence, however, that this relationship is more complex.

3. Three-factor theory of customer satisfaction

The dominant model in customer satisfaction research is based on the disconfirmation of expectations paradigm (Oliver, 1980, 1997). According to this model, satisfaction is formed through a cognitive comparison of perceived

performance with pre-purchase expectations. Perceived performance can be greater than expectations, resulting in positive confirmation (satisfaction), or lower than expectations, resulting in negative disconfirmation (dissatisfaction). If the product performs as expected, the comparison results in moderate satisfaction or indifference. In this context, it is important to distinguish between different types of quality attributes as has been proposed by Kano (1984). In his model, quality attributes are grouped into three categories with a different impact on customer satisfaction (see Fig. 2).

Basic factors (dissatisfiers) are minimum requirements that cause dissatisfaction if not fulfilled but do not lead to customer satisfaction if fulfilled or exceeded; negative performance on these attributes has a greater impact on overall satisfaction than positive performance. The fulfilment of basic requirements is a necessary, but not sufficient condition for satisfaction. Basic factors are entirely expected. The customer regards them as prerequisites; they are taken for granted.

Excitement factors (satisfiers) are the factors that increase customer satisfaction if delivered but do not cause dissatisfaction if they are not delivered; in other words, positive performance on these attributes has a greater impact on overall satisfaction than negative performance. Excitement factors surprise the customer and generate “delight.”

Performance factors lead to satisfaction if performance is high and to dissatisfaction if performance is low. In this case the attribute performance–overall satisfaction relationship is linear and symmetric.

The basic idea of this model has been well adopted in current research (Anderson & Mittal, 2000; Gale, 1994;

Johnston, 1995; Matzler & Sauerwein, 2002; Oliver, 1997; Vavra, 1997). This model implies that basic factors establish a market entry “threshold.” If they are delivered at a satisfactory level, an increase of their performance does not lead to an increase of customer satisfaction. Performance factors typically are directly connected to customers’ explicit needs and desires. Therefore, a company should be competitive with regard to performance factors. Excitement factors are unexpected and surprise the customer. As they generate “delight,” a company should try to stand out from the rest as regards these attributes.

In this theory, quality attributes have two key characteristics: (1) Importance of a basic or an excitement attribute depends on its performance. Basic attributes are decisive if performance is low, but are unimportant if performance is high. Excitement factors are important if performance is high but are not relevant when performance is low. The three-factor theory of customer satisfaction contradicts the traditional view that the relative importance of service attributes is adequately represented as a point estimate. Rather, it has to be seen as a function of satisfaction (Matzler, Sauerwein, & Heischmidt, 2003). (2) Consequently, the relationship between attribute-level performance and overall satisfaction is asymmetric. Therefore, the applicability of IPA and its managerial recommendations have to be questioned.

In the following section, the findings of an empirical study to measure the asymmetric relationship between attribute-level performance and overall performance are reported. Then, based on these findings, it is demonstrated that the traditional IPA is misleading and needs to be revised.

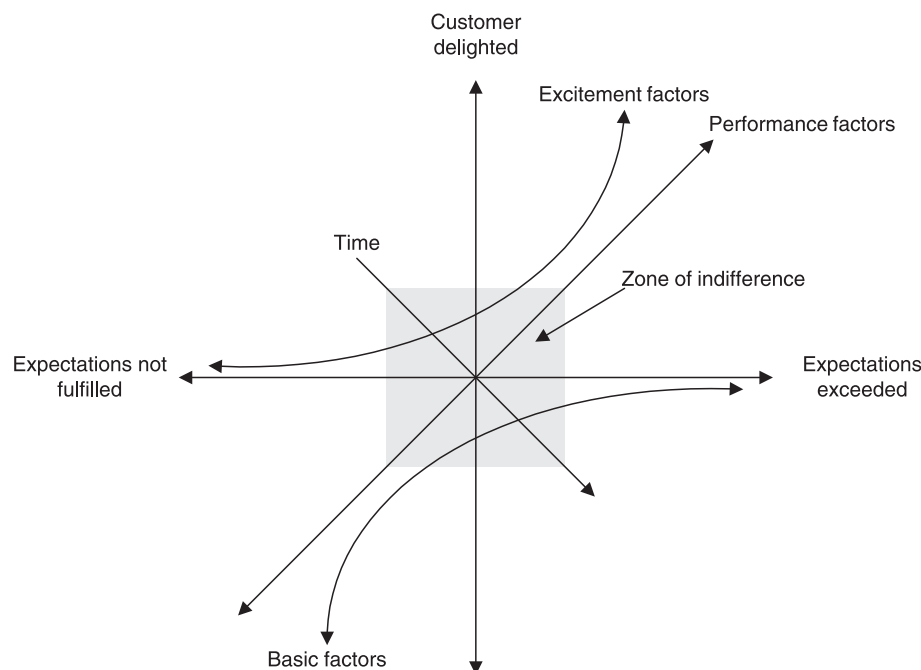


Fig. 2. Three-factor theory (adapted from Kano, 1984).

4. Method and sample of the study

In this study, customer satisfaction of a supplier in the automotive industry was measured. First, satisfaction drivers were identified in an exploratory study. Then, a standardized questionnaire was designed to measure attribute performance and overall satisfaction. A scale from 1 (*extremely low*) to 10 (*extremely high*) was used. Data from 259 customers were collected in face-to-face interviews.

5. Data analysis and results

To construct the importance–performance matrix, the mean of the customer’s satisfaction ratings was calculated. Attribute importance was measured using a multiple regression analysis with overall satisfaction as the dependent and attribute performance as the independent variables. The results are shown in Table 1.

Fig. 3 shows the IPA. The means were used to split the axes. The analysis yields the following managerial recommendations:

- Quadrant I (high importance, high performance): quality of products (QoP) is the key driver of customer satisfaction, and the management’s job is to ensure that the company “keeps up the good work.”
- Quadrant II (high importance, low performance): no attribute in this quadrant.
- Quadrant III (low importance, low performance): customer handling (CH), project management (PM), and innovativeness (Inno) are attributes of low priority. Their poor performance is apparently not a problem, as they are relatively unimportant. Their performance should only be improved if there are no attributes in quadrant II (higher priority) and/or if the improvements are not too costly.
- Quadrant IV (low importance, high performance): customer care (CC) and functionality of design (FoD) can be viewed as areas of performance “overkill.” They are relatively unimportant to the customers but the

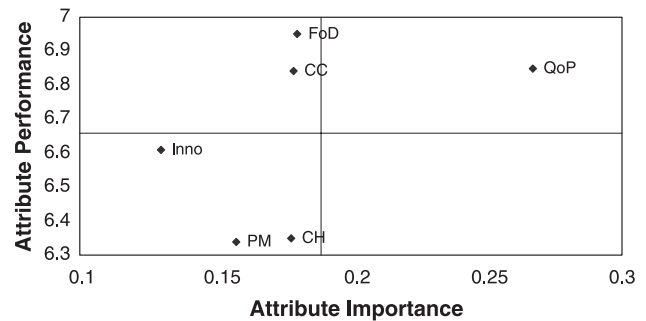


Fig. 3. Importance–performance analysis.

company performs very well. Management might wish to reallocate resources to quadrant II.

Attribute importance, however, as has been discussed above, is a function of attribute performance. Therefore, the asymmetric impact of each attribute’s performance on overall satisfaction has to be assessed before managerial implications are derived.

Several authors (e.g., Anderson & Mittal, 2000; Brandt, 1988; Matzler & Sauerwein, 2002; Mittal, Ross, & Baldasare, 1998) use regression analysis with dummy variables to identify the asymmetric impact of attribute performance on overall satisfaction. In essence, one set of dummy variables is created and used to quantify excitement factors, and another set is created to quantify basic factors. Basic factors and excitement factors are expressed in scale units of the dependent variable (overall satisfaction). In order to conduct the analysis, attribute satisfaction ratings are recoded. Performance ratings are recoded to form the dummy variables such that “low performance” is coded (0,1), “high performance” (1,0), and “average performance” (0,0). Based on this coding scheme, a multiple regression analysis is conducted. For each variable, two regression coefficients are obtained—one to measure the impact when performance is low, the other one when performance is high—in order to estimate the asymmetric impact of attribute-level performance on overall performance. The advantage of this method is that

Table 1
Attribute importance and satisfaction

Attribute	Regression coefficients	Attribute satisfaction (S.D.)
1. Quality of products	.263***	6.85 (1.81)
2. Functionality of design	.172***	6.95 (1.52)
3. Customer care	.171***	6.84 (1.99)
4. Complaints handling	.170**	6.35 (1.94)
5. Project management	.152**	6.34 (2.04)
6. Innovativeness	.127**	6.61 (1.64)

$R^2=.637$.

** $P < .01$.

*** $P < .001$.

Table 2
Dummy variable regression results

Attribute	Dummy-variable regression coefficients	
	Low performance	High performance
1. Quality of products	-.160***	.120**
2. Functionality of design	-.136***	.120**
3. Customer care	-.095*	.131**
4. Complaints handling	-.120**	.036 (ns)
5. Project management	-.143***	-.018 (ns)
6. Innovativeness	-.122**	-.028 (ns)

$R^2=.500$.

ns = not significant.

* $P < .10$.

** $P < .05$.

*** $P < .01$.

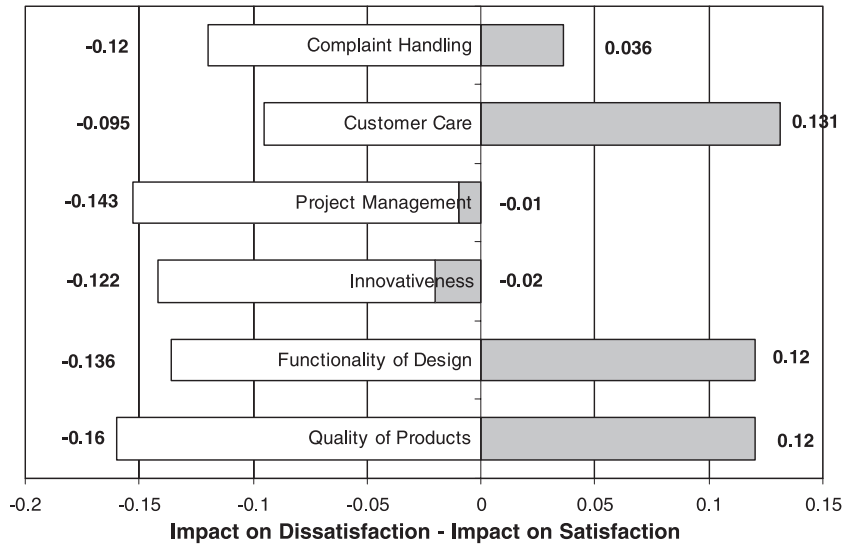


Fig. 4. The asymmetric impact of attribute-level performance on overall satisfaction.

it is based on information that typically is collected in each customer satisfaction measurement program (attribute-level performance and overall satisfaction). Table 2 reports the regression coefficients; Fig. 4 visualizes the results graphically.

In this study, “innovativeness,” “project management” and “complaint handling” can be classified as basic factors. Their impact on overall satisfaction is high when performance is low, but they do not affect satisfaction when performance is high. “Quality of products” and “function-

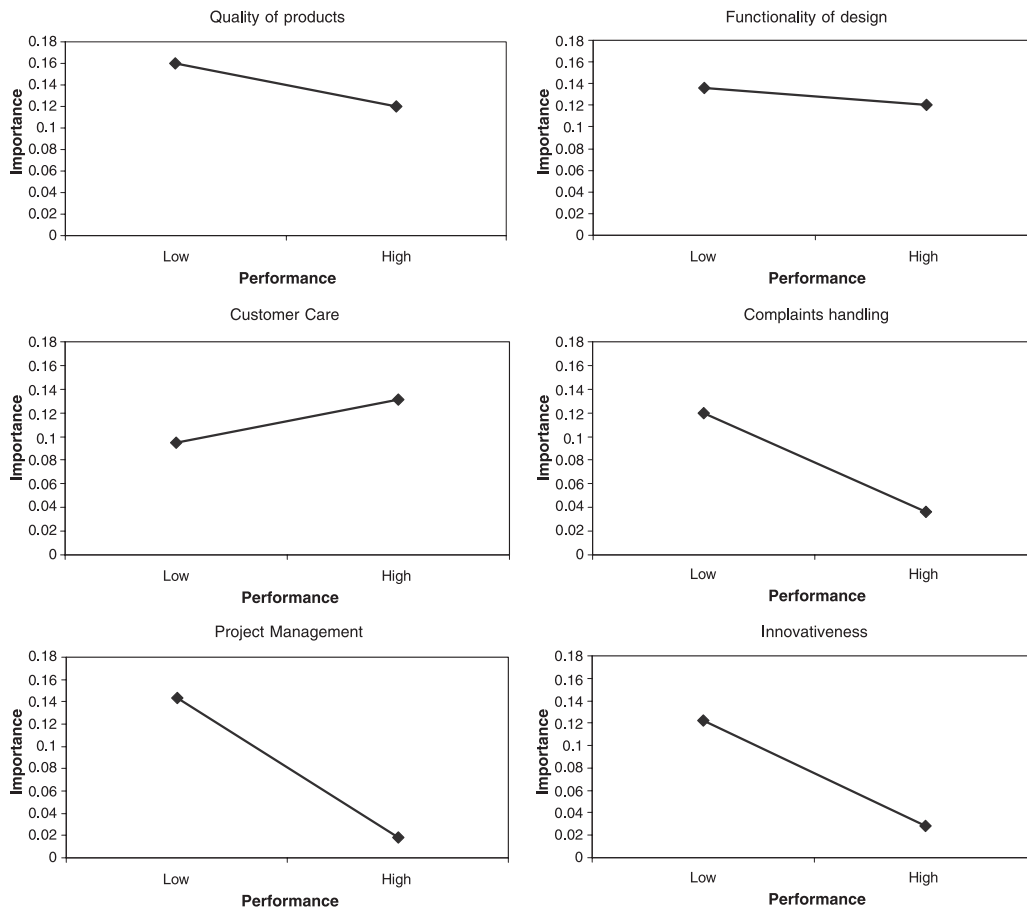


Fig. 5. Importance and performance changes.

ality of design” can be seen as performance factors, although their impact is slightly higher when performance is low. The only attribute that has a higher impact on overall satisfaction when performance is high is “customer care.” It can be classified as an excitement factor.

Fig. 5 illustrates the changes of attribute importance depending on performance.

In order to demonstrate that strategies derived from the traditional IPA (Fig. 3) are misleading, the sample was grouped into satisfied (7 to 10 on the satisfaction scale) and dissatisfied (1 to 6 on the satisfaction scale) customers. Then, for both groups the IPA matrix was constructed (Figs. 6 and 7).

The IPA for dissatisfied customers suggests improving project management with priority. Customer care is in the area of “possible overkill” and management could decide to devote fewer resources to this attribute. Complaint handling is relatively unimportant and would not be improved with priority. Considering the asymmetric relationship between attribute performance and overall satisfaction (Table 2), these conclusions are misleading. Customer care is an excitement factor. If performance is improved its importance increases. Thus, instead of lowering the performance the company should decide to improve it. Project management is a basic factor. In this case, the company would decide to improve it with priority, which indeed is necessary. However, management would expect that if performance is high enough it constitutes a competitive advantage. However, higher performance would lead to lower importance. Thus, it will never be in the upper right quadrant.

IPA for satisfied customers reveals a completely different picture. Project management, for instance, is in the lower left quadrant. Thus, management would do nothing about it, a lower performance would be accepted. As project management is a basic factor, lower performance would increase its importance and it would move to the lower right quadrant and become a serious threat. Innovativeness would be considered as possible overkill and management could decide to devote fewer resources to innovation management. Consequently, innovativeness would move to the lower right quadrant, thus forming a competitive disadvantage.

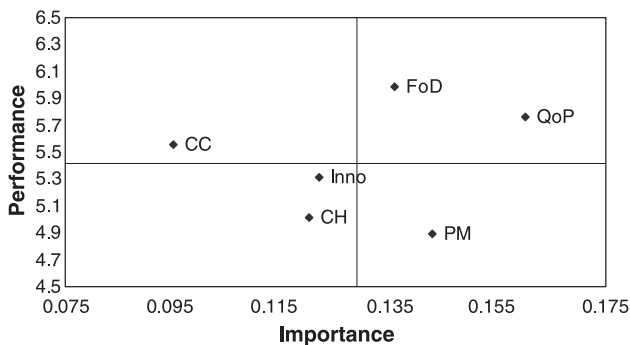


Fig. 6. IPA for dissatisfied customers.

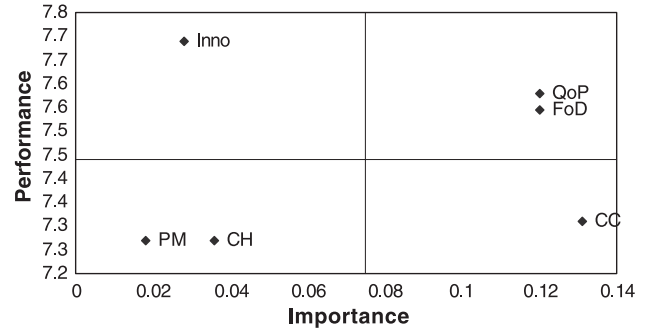


Fig. 7. IPA for satisfied customers.

Compared with IPA in Fig. 3, the differences in the managerial recommendations become even clearer. To sum up, IPA is not an appropriate tool to make decisions about allocating resources as attribute importance and attribute performance are not independent.

6. Conclusions

As has been shown in this study, the three-factor theory of customer satisfaction calls into question the applicability of IPA and its managerial recommendations. Managers need to be aware that a change of attribute performance (satisfaction) can be associated with a change of attribute importance. Therefore, it is crucial to estimate the relative impact of each attribute for high and low performance. Attributes need to be classified in basic, excitement, and performance factors.

If the asymmetries are not considered, the impact of the different attributes on overall satisfaction is not correctly assessed. Importance depends on performance (see Fig. 8). The importance of basic factors is underestimated if per-

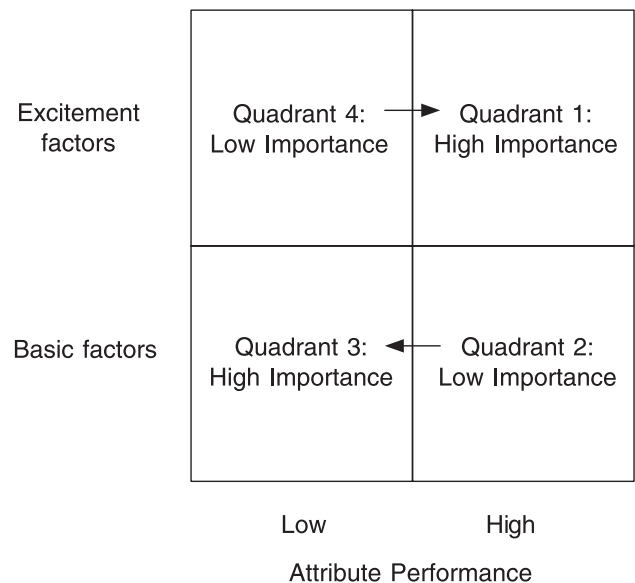


Fig. 8. Attribute classification and importance (adapted from Matzler & Sauerwein, 2002).

formance is high, and overestimated if performance is low. If the performance of excitement factors is low, their impact is underestimated and vice versa.

In order to set the right priorities in customer satisfaction management, managers need to know into which category product attributes fall. Only then can effective decisions be made. As a rule of thumb, the following implications emerge: fulfil all basic factors, be competitive with regard to performance factors, and stand out from competition regarding excitement factors.

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