

EXPLOITING PRODUCT STRENGTHS

The Strategic Determinancy Approach to Brand Management

HOW A MAJOR MANUFACTURER REPOSITIONED A CAPITAL EQUIPMENT PRODUCT

by Behram J. Hansotia, Muzaffar A. Shaikh and Jagdish N. Sheth

According to prevailing marketing thought, business customers and consumers alike perceive products as bundles of attributes. Those attributes are defined in terms of the benefits customers perceive products to be offering. Generally, attributes are not confined to the physical characteristics of a product but may include economic, sociological and psychological benefits related to the product and the way it's sold and serviced.

Therefore, the product strategist must know the attributes which are "determinants" of customers' choices—the reasons people buy. Recently, determinancy analysis, which identifies those key attributes, has been successfully applied in a number of product and financial services marketing applications.

In this paper, we extend some of the existing ideas on identification of determinant attributes by introducing "determinancy space" concepts as aids for repositioning a brand relative to its competitors. Then we'll examine how determinancy analysis was actually applied in an industrial capital equipment repositioning program.

PERCEIVED IMPORTANCE

Marketing managers constantly face questions pertaining to their brands and competition. Which other brands are key competitors, and how does the manager's own brand stack up against them? What product attributes do customers really use in selecting the product, and in that context, what are the manager's brand's

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Figure 1
Determinant and Non-Determinant Attributes

	Attribute					
	Determinant		Non-Determinant			
	D ₁	D ₂	ND ₁	ND ₂	ND ₃	ND ₄
Important	x	x	x			
Not Important				x	x	x
Non-Differentiating (SB=COMP)			x	x		
Differentiating (SB>COMP)	x				x	
Differentiating (SB<COMP)		x				x

SB: Sponsor Brand COMP: Competing Brand

Possible Attribute Types

Determinant:
 D₁—Attribute is important as well as differentiating but Sponsor Brand is superior to Competing Brand (SB>COMP).
 D₂—Attribute is important as well as differentiating but Sponsor Brand is inferior to Competing Brand (SB<COMP).

Non-Determinant:
 ND₁—Attribute is important but not differentiating. Statistically, SB and COMP are perceived to be equal (SB=COMP).
 ND₂—Attribute is neither important or non-differentiating.
 ND₃—Attribute is differentiating (SB>COMP) but not important.
 ND₄—Attribute is differentiating (SB<COMP) but not important.

basic strengths and weaknesses? Finally, the manager must devise strategies to outperform the competition. Answers to those questions lie in the concept of determinant attributes, first put forth by marketing professors James H. Myers of the Clairmont Graduate School of Business, Clairmont, Cal., and Mark I. Alpert of the University of Texas, Austin.

An attribute is determinant if it is both important and differentiating. For example, most individuals consider auto safety to be very important. But they do not perceive cars from different automakers to be sufficiently different enough from a safety viewpoint for safety to be a dif-

ferentiating attribute in their purchasing decisions. However, General Motors recently tried to make the safety attribute determinant by informing consumers about the high safety ratings of its automobiles compared to Japanese exports. GM knew that safety was important to everyone; if it could change consumer perception on relative auto safety, GM felt it could enhance its cars' value as perceived by consumers. It is exactly those types of strategies that our method aims to identify and develop.

Figure 1 shows the different possible types of determinant and non-determinant attributes. A brand man-

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ager may find his brand's (SB—sponsor brand) attributes in any one of several mutually exclusive categories.

In our example, only two attributes are determinant; each is considered by customers to be both important and differentiating. Three other attributes are not considered important, and one that is important nonetheless is not differentiating in customers' opinions.

How can the strategist use that information to enhance his brand's perceived value? He could increase, decrease or maintain the perceived importance of each attribute. Or he could increase, decrease or maintain perceived brand differences. He also could change attributes' perceived importance and differentiation simultaneously.

Figure 2 shows how the attributes in Figure 1 conceivably could be changed. Each of the nine cells of the Strategy Matrix designates a generic strategy with which a brand manager might want to change each attribute. For example, the upper left cell (increase importance and brand differentiation) is a strategy calling for measures or programs to 1) increase the attribute's importance to customers, and 2) increase the difference between the competition and the sponsor brand.

The increase in brand difference may be accomplished by altering beliefs about the company's brand, or competitors' brands.

And a fairly standard way of enhancing an attribute's perceived importance is by showing how the attribute is associated with another important attribute. For example, the taste of toothpaste may not be important to parents, but preventing tooth decay definitely is. The Aim brand, recognizing it had an advantage over the competition in taste, told parents that because its toothpaste tastes better, Johnny will brush longer, resulting in better checkups for Johnny.

Of the attributes shown in Figure 1, D_1 is the attribute most preferred by a brand manager. Hence, he would like to convert attributes, whenever he can, into D_1 attributes. Figure 2 shows how ND_1 , ND_2 and ND_3 can be converted into D_1 attributes. Among the non-determinant attributes, ND_1 and ND_3 can be converted to D_1 by increasing brand difference and attribute importance respectively. Converting ND_2 into D_1 requires enhancing both importance and brand difference.

D_2 , being the type of attribute least preferred by the brand manager, needs to be converted at least into a non-determinant attribute. The matrix shows what needs to be done to convert it into an ND_1 or ND_4 attribute.

If an attribute is ND_4 , it is perceived to be unimportant and the competition is perceived to be superior. As long as the attribute remains unimportant, there should be no concern and the manager should make no attempt to change the status quo.

But if the competition has that information, it would want to convert an ND_4 attribute into a D_2 attribute. Likewise, the competitor would want to turn our brand manager's D_1 attributes into ND_1 or ND_3 type attributes.

Hence, constant vigilance is required by the brand manager to ensure that the competitor does not change the status quo.

DETERMINANCY SPACE

As we've pointed out, attributes are determinant or non-determinant with respect to a sponsor brand's competitors. We define those competitors as the "evoked set" of brands the buyer says he would actually consider in the purchasing process for the type of product under study.

Buyers try to reduce risk by gathering information and reflecting on the relative importance of the different attributes of the product class, and the relative performance of competing brands on those attributes. Such problem solving behavior, which our model is designed to describe, is particularly extensive when buyers confront an unfamiliar product class, such as in making an infrequent, expensive choice of an industrial product with a long life cycle.

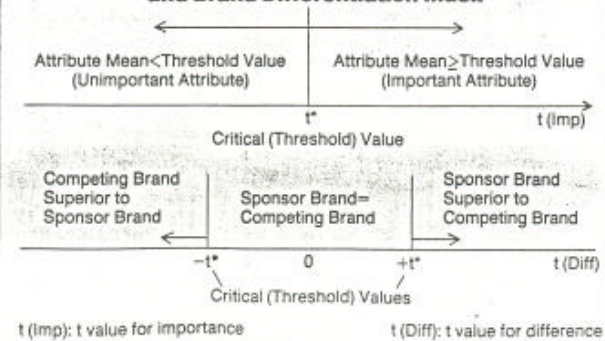
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Figure 2 Strategy Matrix

		Brand Difference		
		Increase	Decrease	Maintain
Importance	Increase	$ND_2 \rightarrow D_1$		$ND_3 \rightarrow D_1$
	Decrease			$D_2 \rightarrow ND_4$
	Maintain	$ND_1 \rightarrow D_1$	$D_2 \rightarrow ND_1$	$ND_4 \rightarrow ND_4$ $D_1 \rightarrow D_1$

Note, the brand difference may be positive or negative, depending on whether the Sponsor Brand or Competing Brand is perceived to be superior.

Figure 3 Key Regions with Respect to Importance Index and Brand Differentiation Index



t (Imp): t value for importance

t (Diff): t value for difference

tomers perceptions in order to operationalize the strategic determinancy approach and choose potent strategies. He must survey his prospects, asking them:

- Which are the specific attributes of the product class, their relative rank in importance, and how each rates in importance. We suggest a scalar rating, such as a 1-to-5 rating.

- Which brands in the product class they would consider buying. We recommend an unaided recall approach; don't suggest brand names to them.

- How each brand stacks up on each attribute. Again, we suggest a scalar rating.

In the data analysis stage, the observations are separated into sets consisting of the same evoked brands.

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(In order to make the indices projectable to the entire class of customers who we infer would name the same set of brands, we recommend using the statistical t distribution to calculate them—using the one-way t statistic for the importance index and the two-way paired t statistic for the differentiation index. It's a commonly used method for testing hypotheses about means.)

Figure 3 represents the importance and differentiation indices graphically.

For example, suppose the brand manager decides that the sample average importance rating across all attributes is the threshold importance level. He can now establish a critical t value such that he is, say, 95% certain that if an attribute's t value is larger than that critical value, then the population mean importance rating for the attribute is also larger than that threshold value.

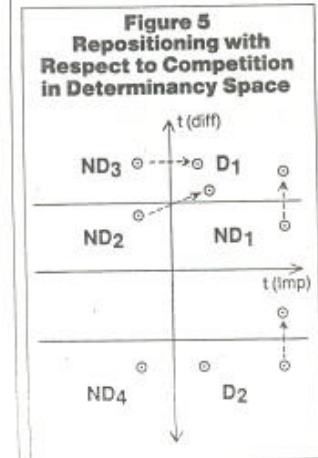
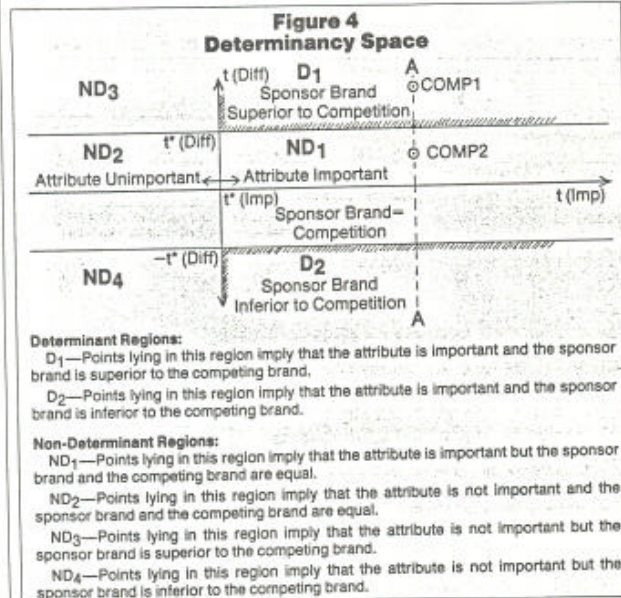
Similarly, we can establish a pair of symmetrical critical t values (one positive, the other negative) in the brand differentiation case to establish three regions:

- A middle region, lying between the negative and positive critical values, where we cannot be 95% certain that differences exist in brand performance;
- A region to the left of the negative critical value, where we are 95% certain that the competing brand is superior to the sponsor company's brand; and
- A region to the right of the positive critical value, where we are 95% certain that the sponsor company's brand is superior to the competing brand.

(The critical t values depend on the number of observations in the evoked set, the level of confidence we want in our results, and the number of statements we require to hold jointly. In this case, for an attribute to be determinant with respect to a given competing brand, it must be perceived to be statistically important and differentiating. Hence, we expect two statements to be jointly true to declare an attribute 'determinant.')

The two indices can be used as the axes of a chart to produce what we call a "determinancy space," as shown in Figure 4. Associated with each attribute is a t value for importance $t(\text{Imp})$, and one or more t values $t(\text{Diff})$ for brand differentiation, depending upon the number of brands in

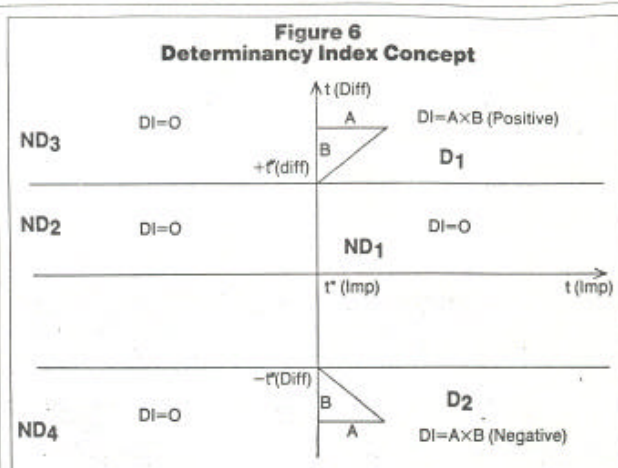
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For example, one group of customers may consider brands B, C and D, and another group may consider brands A, B and C.

The customers naming the set B, C and D are first analyzed separately from the set evoking A, B and C. We recommend this approach to segmentation because customers having similar needs and values will tend to consider similar brands for purchase. The discussion which follows refers to a given evoked set of brand names.

The brand manager next calculates an importance index and brand differentiation index for each attribute, for each brand. The importance index specifies the attribute's mean importance level from a given threshold, below which the attribute is deemed unimportant. The differentiation index compares a brand's rating on the attribute—generally the sponsor's brand—to one other brand in the



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an evoked set.

In keeping with the description of attribute types in Figure 1, we have defined the two determinant regions in the determinancy space as D_1 and D_2 (shaded in Figure 4) and the four non-determinant regions as ND_1 through ND_4 .

For example, if there are three brands in an evoked set, the sponsor company's brand and two competing brands, then there are two t values for brand differentiation. A paired t value is needed for comparing the sponsor company's brand to each of the two competing brands.

Each competing brand can thus be represented by a point in the determinancy space. For a given attribute and two competing brands, the points will thus lie on a vertical line passing through the $t(\text{Imp})$ value for that attribute. For example, the dotted line A-A in Figure 4 represents an attribute under study. On that line, the positions of two competing brands, COMP1 and COMP2, are depicted with respect to the sponsor brand. Note that the attribute is determinant only for COMP1 and the sponsor brand. COMP2 is not sufficiently inferior to the sponsor brand, in terms of the attribute, to be differentiating. Hence the attribute is an ND_1 type when comparing the sponsor brand with COMP2, although it's a D_2 type attribute when the sponsor and COMP1 are compared.

TACTICAL FOLLOW-THROUGH

Using the determinancy space ap-

proach, the brand manager creates a spatial representation of his brand's position relative to competitors in terms of each attribute. The graph itself suggests appropriate repositioning strategies, and is particularly helpful in communicating the analysis to other individuals.

For example, Figure 5 represents the generic strategies cited in Figure 2. The dotted arrows indicate how the manager may want to reposition specific attributes in the determinancy space.

As we shall see in our example, very specific programs, of course, need to be created to accomplish repositioning. That is where the manager must exercise his tactical creativity to change attributes' importance or differentiation. For example, location of a competitor's point in the region D_2 does not necessarily mean that the sponsor company's brand is inferior to the competition on that attribute. It does indicate, however, that customers have that perception. The sponsor company may want to have the brands compared independently in a laboratory or have consumers compare their brand and the competition more objectively.

The sponsor company may very well find out, however, that customer perceptions are accurate. Then, modifying the design of the product or service to make the sponsor brand superior to the competition may be an appropriate strategy. A creative communications program would, of course, still be required to change customer perception of the "new, im-

proved" product.

Note that the analysis can be carried out for any market segment. In practice, market segments may be quite complex. In business/industrial marketing, for instance, the size of the customer firm, the different decision-makers within the customer firm, and different product sizes may all require separate analysis. In each case, a particular analysis should be carried out for a common set of evoked brands.

We also suggest calculating a "determinancy index" (DI) for each attribute/brand pair combination in the evoked set of brands. Figure 6 shows the possible values that DI should take in the various regions of determinancy space.

As shown, DI should be zero on the left of the vertical line (regions ND_2 , ND_3 , and ND_4) that represents the position of attributes which are below the threshold level of importance $t^*(\text{Imp})$. The zero value implies that unimportant attributes cannot be determinant. Similarly, DI in region ND_1 should be zero, implying that even though an attribute may be important, it cannot be determinant if it is not differentiating.

In regions D_1 and D_2 , DI is defined as the product of A and B, the importance and differentiation indices respectively. DI should be positive in region D_1 because $t(\text{Diff})$ is positive in that region, implying that the sponsor brand is superior to the competing brand. In region D_2 , $t(\text{Diff})$ is negative, suggesting that the competing brand is superior to the sponsor brand. DI, in that region should, therefore, also be negative.

Besides providing a quantification scheme to compute determinancy, the Determinancy Index concept lends itself to defining three additional concepts: Attribute Leverage, Brand Leverage and Total Leverage.

In the determinancy context, leverage is defined as the difference between average perceived value of the sponsor brand vis-a-vis the competing brand.

- *Attribute leverage* is obtained by summing DI's across all brands in the evoked set for an attribute.
- *Brand leverage* for a specific brand is calculated by adding DI's across all attributes. It represents the strength or weakness of that brand with respect to the sponsor company's brand.
- *Total leverage* is obtained either by adding all attribute leverages or all brand leverages. It provides a mea-

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sure of overall superiority or inferiority of the sponsor brand compared to all competing brands for all attributes.

The brand manager can use leverage for marketing planning and control. He may, for example, set target values of attribute leverage as objectives for communications, promotion, testing, and R&D programs. Similar goals can also be set for brand leverage. And the manager may wish to track his brand's overall success over time with the total leverage rating.

AN INDUSTRIAL EXAMPLE

We applied the determinancy analysis approach to an industrial capital equipment product at a major corporation, collecting survey data for three product sizes sold to two segments of decision-makers. We identified 15 attributes which were determinant or non-determinant, depending on the product and market segment. The information allowed the sponsor company to form short- and long-term strategies, a number of which were promptly implemented to enhance the profitability of the product.

We'll discuss highlights of that actual program, disguising information for proprietary reasons.

The sponsor brand, a fast-growing, important product in a major division of the sponsor company, recently underwent a broad analysis of its price/cost/value relationships in the marketplace. Determinancy Analysis was only one part—albeit an important one—of the project.

The determinancy analysis had three dimensions:

- Product size: small, medium and large capacity.
- Decision-makers: end-users and consulting engineers.
- Competition: brands Alpha, Beta, Gamma and Lambda.

Statistical and economic considerations required a national survey sample of 500, divided equally among the two decision-maker segments. A list of 2,000 names (enough to allow for non-response and unqualified respondents) was provided to a telephone marketing research firm which conducted the survey. The consulting engineer sample was drawn from a major publishers' circulation lists and stratified geographically. We obtained end-user listings from Dun & Bradstreet lists, and stratified the sample by size and Standard Industrial Classification (SIC) codes.

Figure 7
Attributes Ranked by
Importance (all product sizes,
all market segments combined)

1. Reliability
2. Parts and service support
3. Manufacturer's reputation
4. Dealer's reputation
5. Availability of technical literature
6. Ease of maintenance
7. Help in installation
8. Warranty
9. Noise and vibration control
10. Timely delivery
11. Existence of special features
12. Dealer contacts
13. Price
14. Dealer inspection programs
15. Annual operating costs

We selected 15 attributes (see Figure 7) from an original list of 26 after pretesting the questionnaire. Pretesting also helped in rewording some of the questions, and further refining the questionnaire. The final list of attributes encompassed a wide variety

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of product, dealer and manufacturer characteristics on engineering, marketing and financial matters. We used five-point rating scales with a "5," for example, indicating an "extremely important" response. Figure 7 ranks the attributes according to the importance ratings of the entire survey sample.

The study confirmed some of management's views about the market's perceptions. For example, reliability and parts and service support always appeared as the most important attributes. Price was more important in the small product size segment than in the larger size, and was somewhat

more important to end-users than to consulting engineers.

The study also provided some surprises.

Price was not nearly as important as management initially believed. That implied that the sponsor company has opportunities to increase revenue through product differentiation and special services.

The sponsor brand enjoyed an outstanding rating on reliability and parts and service support, both attributes generally being determinant for the company against most competitors.

To piggyback on their superior product and further reinforce the importance of both attributes, management decided to offer an enhanced warranty program.

Warranty itself was not a determinant attribute, however. Although important to both segments, end-users and consulting engineers didn't consider the brands' warranties to be very different. Therefore, we expect that enhancing the warranty program and setting a new warranty standard for the industry will make the attribute determinant, adding to the sponsor brand's leverage over competitors. We expect that the sponsor brand's reputation on other attributes—such as reliability, overall manufacturer's reputation and dealers' reputation—will also benefit from the new warranty program.

Among our detailed findings, we learned that the sponsor brand dominates all competitors in the large and medium size products, but not in the small size with respect to a key segment, consulting engineers. Those buying influences (a group of 110 respondents) named Gamma and Lambda, as well as the sponsor brand, as the brands they would consider purchasing. And 9 of the 15 attributes turned out to be important (at the 95% level of statistical confidence) for the consulting engineer market segment.

SEGMENT STRATEGIES

Examining just that segment of engineers in the market for the small product, the sponsor brand dominated Gamma on all but two of those 9 attributes; the two others were non-determinant because engineers rated both brands more or less equal in terms of those attributes. But the picture wasn't as clear comparing the sponsor brand to Lambda. For example, the sponsor's superiority on the parts and service support and war-

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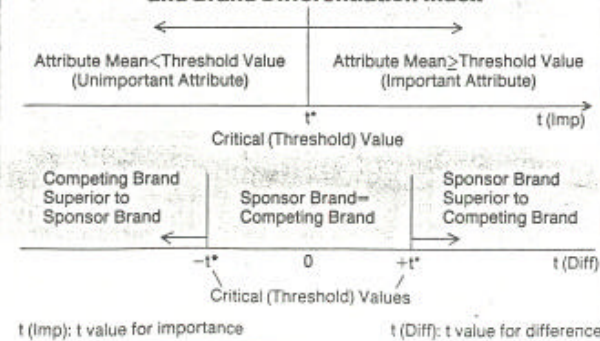
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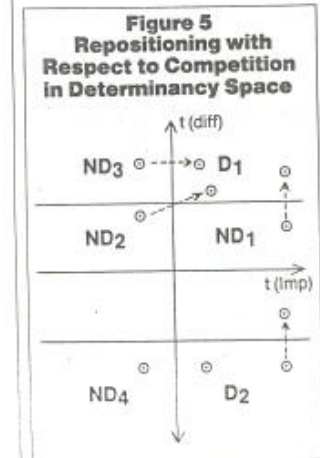
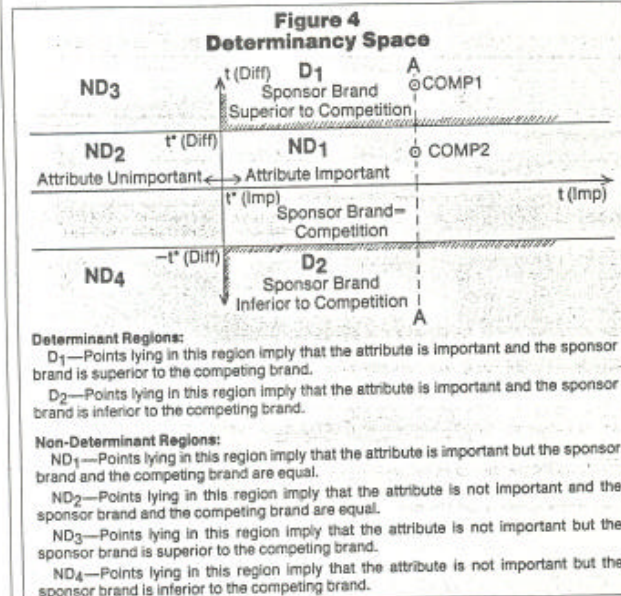
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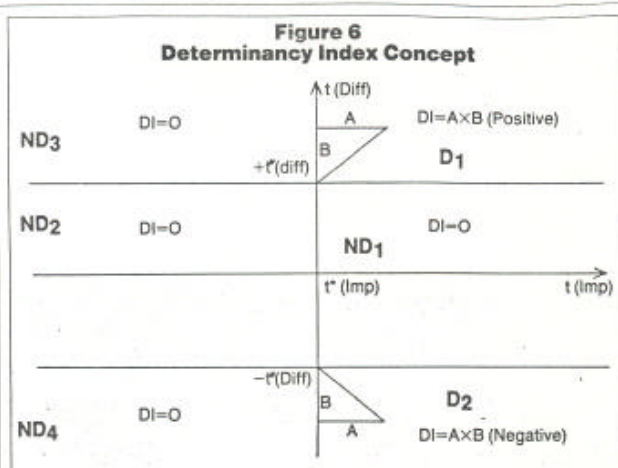
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Note that the analysis can be carried out for any market segment. In practice, market segments may be quite complex. In business/industrial marketing, for instance, the size of the customer firm, the different decision-makers within the customer firm, and different product sizes may all require separate analysis. In each case, a particular analysis should be carried out for a common set of evoked brands.

We also suggest calculating a "determinancy index" (DI) for each attribute/brand pair combination in the evoked set of brands. Figure 6 shows the possible values that DI should take in the various regions of determinancy space.

As shown, DI should be zero on the left of the vertical line (regions ND_2 , ND_3 , and ND_4) that represents the position of attributes which are below the threshold level of importance $t^*(\text{Imp})$. The zero value implies that unimportant attributes cannot be determinant. Similarly, DI in region ND_1 should be zero, implying that even though an attribute may be important, it cannot be determinant if it is not differentiating.

In regions D_1 and D_2 , DI is defined as the product of A and B, the importance and differentiation indices respectively. DI should be positive in region D_1 because $t(\text{Diff})$ is positive in that region, implying that the sponsor brand is superior to the competing brand. In region D_2 , $t(\text{Diff})$ is negative, suggesting that the competing brand is superior to the sponsor brand. DI, in that region should, therefore, also be negative.

Besides providing a quantification scheme to compute determinancy, the Determinancy Index concept lends itself to defining three additional concepts: Attribute Leverage, Brand Leverage and Total Leverage.

In the determinancy context, leverage is defined as the difference between average perceived value of the sponsor brand vis-a-vis the competing brand.

- *Attribute leverage* is obtained by summing DI's across all brands in the evoked set for an attribute.
- *Brand leverage* for a specific brand is calculated by adding DI's across all attributes. It represents the strength or weakness of that brand with respect to the sponsor company's brand.
- *Total leverage* is obtained either by adding all attribute leverages or all brand leverages. It provides a mea-

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sure of overall superiority or inferiority of the sponsor brand compared to all competing brands for all attributes.

The brand manager can use leverage for marketing planning and control. He may, for example, set target values of attribute leverage as objectives for communications, promotion, testing, and R&D programs. Similar goals can also be set for brand leverages. And the manager may wish to track his brand's overall success over time with the total leverage rating.

AN INDUSTRIAL EXAMPLE

We applied the determinancy analysis approach to an industrial capital equipment product at a major corporation, collecting survey data for three product sizes sold to two segments of decision-makers. We identified 15 attributes which were determinant or non-determinant, depending on the product and market segment. The information allowed the sponsor company to form short- and long-term strategies, a number of which were promptly implemented to enhance the profitability of the product.

We'll discuss highlights of that actual program, disguising information for proprietary reasons.

The sponsor brand, a fast-growing, important product in a major division of the sponsor company, recently underwent a broad analysis of its price/cost/value relationships in the marketplace. Determinancy Analysis was only one part—albeit an important one—of the project.

The determinancy analysis had three dimensions:

- Product size: small, medium and large capacity.
- Decision-makers: end-users and consulting engineers.
- Competition: brands Alpha, Beta, Gamma and Lambda.

Statistical and economic considerations required a national survey sample of 500, divided equally among the two decision-maker segments. A list of 2,000 names (enough to allow for non-response and unqualified respondents) was provided to a telephone marketing research firm which conducted the survey. The consulting engineer sample was drawn from a major publishers' circulation lists and stratified geographically. We obtained end-user listings from Dun & Bradstreet lists, and stratified the sample by size and Standard Industrial Classification (SIC) codes.

Figure 7
Attributes Ranked by
Importance (all product sizes,
all market segments combined)

1. Reliability
2. Parts and service support
3. Manufacturer's reputation
4. Dealer's reputation
5. Availability of technical literature
6. Ease of maintenance
7. Help in installation
8. Warranty
9. Noise and vibration control
10. Timely delivery
11. Existence of special features
12. Dealer contacts
13. Price
14. Dealer inspection programs
15. Annual operating costs

We selected 15 attributes (see Figure 7) from an original list of 26 after pretesting the questionnaire. Pretesting also helped in rewording some of the questions, and further refining the questionnaire. The final list of attributes encompassed a wide variety

The study confirmed some of management's views about the market's perceptions. Reliability and parts and service support always appeared as the most important attributes.

of product, dealer and manufacturer characteristics on engineering, marketing and financial matters. We used five-point rating scales with a "5," for example, indicating an "extremely important" response. Figure 7 ranks the attributes according to the importance ratings of the entire survey sample.

The study confirmed some of management's views about the market's perceptions. For example, reliability and parts and service support always appeared as the most important attributes. Price was more important in the small product size segment than in the larger size, and was somewhat

more important to end-users than to consulting engineers.

The study also provided some surprises.

Price was not nearly as important as management initially believed. That implied that the sponsor company has opportunities to increase revenue through product differentiation and special services.

The sponsor brand enjoyed an outstanding rating on reliability and parts and service support, both attributes generally being determinant for the company against most competitors.

To piggyback on their superior product and further reinforce the importance of both attributes, management decided to offer an enhanced warranty program.

Warranty itself was not a determinant attribute, however. Although important to both segments, end-users and consulting engineers didn't consider the brands' warranties to be very different. Therefore, we expect that enhancing the warranty program and setting a new warranty standard for the industry will make the attribute determinant, adding to the sponsor brand's leverage over competitors. We expect that the sponsor brand's reputation on other attributes—such as reliability, overall manufacturer's reputation and dealers' reputation—will also benefit from the new warranty program.

Among our detailed findings, we learned that the sponsor brand dominates all competitors in the large and medium size products, but not in the small size with respect to a key segment, consulting engineers. Those buying influences (a group of 110 respondents) named Gamma and Lambda, as well as the sponsor brand, as the brands they would consider purchasing. And 9 of the 15 attributes turned out to be important (at the 95% level of statistical confidence) for the consulting engineer market segment.

SEGMENT STRATEGIES

Examining just that segment of engineers in the market for the small product, the sponsor brand dominated Gamma on all but two of those 9 attributes; the two others were non-determinant because engineers rated both brands more or less equal in terms of those attributes. But the picture wasn't as clear comparing the sponsor brand to Lambda. For example, the sponsor's superiority on the parts and service support and war-