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Designing New Product Portfolios

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Background: It is generally impossible to satisfy every consumer in a target group with a single product. Product portfolios are used to maximize overall consumer satisfaction. Just as one player cannot play every position on a basketball or soccer team, one product cannot play the role of a portfolio. The general problem of interest in this report is to find the optimum position for a portfolio of products so that the proximity of the products to a set of individual consumer ideal points is optimized.

Three Optimum Placement Cases: In the first case a product portfolio is highly dominant. If dominance is severe, the location of competitors can be ignored. The second case occurs when portfolios are well matched and we would like to put additional products on the market. Now it is necessary to consider competitors' positions. Less important positions may be conceded to the competition in order to gain control over more consequential regions. In this case products in the same portfolio may play redundant roles. In the third case we assume that portfolios are equally matched and that we want to avoid the situation in which the team members occupy the same or similar positions. This case would correspond to placing a product portfolio in a competitive market with a desire to avoid cannibalization (taking market share from your own brands.) The models described in this report apply fairly well to a sensory space composed of products and ideals when change occurs in marketed products slowly over time. If the product and ideal positions are highly dynamic leading to rapid change, then it would be necessary to consider a more complex account of the market.

Scenario: Previous research has led to the development of a sensory space in which four of your major competitors' positions (C1 to C4) have been identified along with the locations of two of your existing brands (B1 and B2.) This space (Figure 1) also shows the location of the ideals points of 1000 randomly selected consumers. Consumer ideals are displayed in Figure 1 as contour plots. The more ideals in a particular area, the lighter the area. Methods to develop this map, using Landscape Segmentation Analysis (LSA), have been reported[1,2,3,4,5,6]. These reports and papers can be accessed on our website, www.ifpress.com. From Figure 1 it can be seen that there are three consumer segments. Segment 1, about 50% of the market, prefers C1 and B1. Segment 2, about 30% of the market, prefers C2 and C4. C3 and B2 usually receive the highest average liking ratings in product tests. One can see that they are not disliked by any large group of consumers since they are centrally located, but they do not delight any particular segment. There are no products located near the center of segment 3. You would like to know where to place two new products for the three cases previously described: a) Ignore the competition; b) Take competition into account; and c) Avoid cannibalization while taking competition into account.

Models for Portfolio Placement: Assume that the distance between an ideal point in Figure 1 and a product corresponds to degree of liking. The smaller the distance, the greater the liking. In the first case, in which the competition is ignored, the objective is to place prototype products on the map so that distance is minimized over all consumers. There are two distances for a given consumer ideal, one to each of the prototypes. In order to avoid competition among the prototypes we require that the minimization of distances applies to the smaller of the two distances to each consumer's ideal.

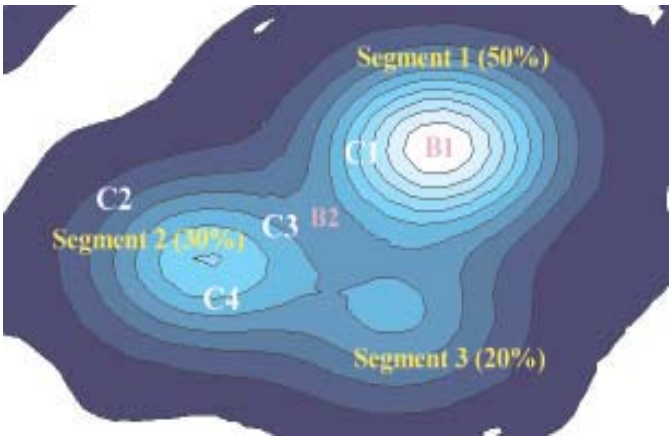

Figure 1: Contour plot (LSA Map) showing three segments, four competitors (C1-C4), and two brands (B1 and B2).

In the second case, where the competition's effect is accounted for, we must consider the relative performance of the prototypes to the competition (C1 to C4). For each prototype there is a probability that a consumer will choose the prototype over the four competitors. Our goal now is to maximize, over all consumers, the maximum of the two first choice probabilities. This choice of maximization criterion takes competition into account while at the same time prevents the prototypes from playing redundant roles. However, it does not account for the positions of your existing products and placement of the prototype products may cause cannibalization.

In the third case the objective is to find the optimum position for the two prototypes, accounting for the effect of competition, but avoiding the possibility that the prototypes and the existing brands play redundant roles. This is achieved by maximizing, over all consumers, the maximum of the four first choice probabilities computed for the prototype and the existing brands as well.

Optimum Portfolio Placement: Figure 2 shows the location of the two prototypes in the absence of competition. The placement of these products is intuitive: One product, P2, is placed close to the center of segment 1 and the other is placed between segments 2 and 3, but closer to segment 2 because of its greater size. When competition is taken into account (Figure 3), P1 concedes the region around segment 2 where there are three competitors and moves toward segment 3 which, although smaller, it can dominate. P2 moves slightly closer to C1 to reduce its first choice probability, but not enough to reduce the appeal of P2 to consumers in the upper right corner of the map.

It can be seen that the strategy to advance or retreat from competition depends on the structure of the map and the availability of options. A comparison of Figures 1 and 3 reveals that P2 and one of your existing brands, B1, occupy very similar positions and P1 is fairly close to your other brand, B2. When your existing brands are accounted for, a dramatic change in prototype placement occurs (Figure 4). P2 moves away from B1 to dominate a region near segment 3. As a consequence, the role played by P1 changes to avoid duplicating the effect of P2 and B2 by moving to the left and occupying a position close to the center of segment 2. P1 is now placed among C2, C3 and C4. With B1, B2, and P2 segment 1, segment 3, and the center of the map, P1's new role appears to be to reduce the possible impact of three competitors C2, C3 and C4.

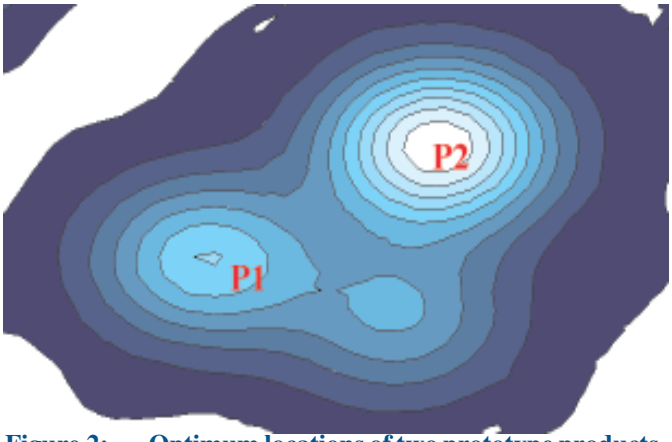

Figure 2: Optimum locations of two prototype products (P1 and P2) without taking competition into account.

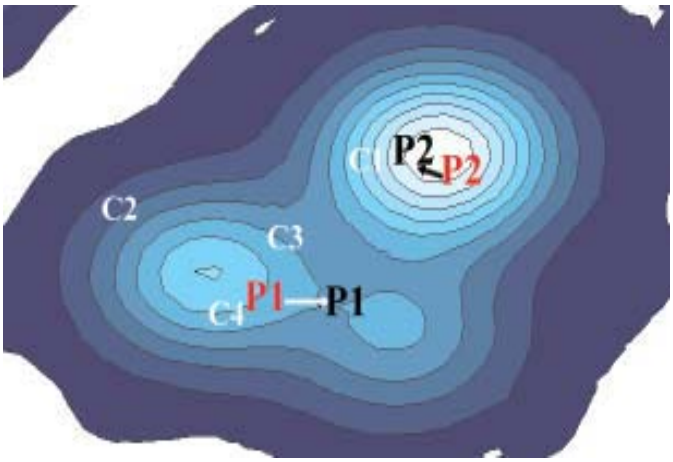

Figure 3: The effect of competition on the positions of two prototypes (black) compared to their positions in the absence of competition (red).

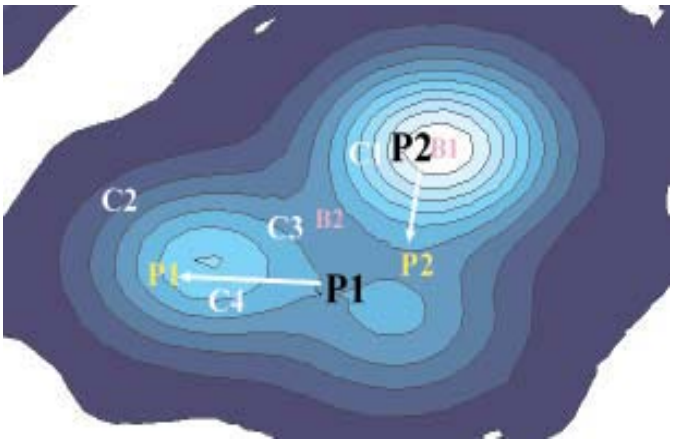

Figure 4: Optimum portfolio product shifts (black to yellow) when both competition and cannibalization are considered.

Conclusion: Once an LSA map has been constructed for a market, it is possible to use alternative strategies to design optimum product portfolios. In the absence of competition, prototype placement is merely an exercise in placing products as closely as possible to ideal positions. When competition is considered prototypes can be positioned to maximize total first choice among the consumer sample. Finally, prototypes can be placed so that they avoid cannibalization of existing brands and account for competitive effects as well. In the analyses reported here competitors were considered equal, both to each other and to your products, or were not considered at all. It is possible to weight competitors' products according to their brand strengths and construct new portfolio options. This concept will be discussed in a future report.

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