TRADEOFFS IN INDUSTRIAL MARKET SEGMENTATION: THEORY AND PRACTICE

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Abstract

Market segmentation is one of the basic concepts in marketing. However, the issues of costs and profits have typically been ignored in discussions of segmentation. This paper introduces a straightforward framework to assess these issues. Various revenue and cost interactions are considered, and problems in implementing this process are discussed.

Introduction

Market segmentation is one of the most fundamental concepts in marketing; even at an abstract level the concept is surprisingly straightforward (Wind 1978). Prospective buyers of a firm's products or services are grouped into clusters with similar needs, those of prospective buyers within one cluster being quite similar to the needs of other buyers within that cluster but quite different from those in other clusters.

The firm's task is to identify these distinct need-based clusters and then design an appropriate marketing program--consisting of the marketing mix elements of product, price, promotion, and distribution--to profitably reach the clusters it selects. The goal of market segmentation is increased marketing efficiency. Therefore, the increased revenue due to segmentation must exceed the combined costs of segmentation research and analysis and the incremental expenses associated with implementing the segmentation strategy.

For market segmentation studies to be useful to marketing managers, at a minimum it is important that the techniques used assist in recognizing the potential profits of adding new segments. This involves not only the cost and response function approximations but also an understanding of the marketing, R & D, and manufacturing/operations synergies of entering new segments. The interactions of all relevant costs on profits should be considered.

The authors will attempt to delineate how these cost/revenue tradeoffs affect segmentation decisions. A framework of segmentation strategies and their possible impact on costs and profits will be examined. Then comparisons will be drawn between theoretically "correct" approaches and ones which may be mandated by organizational realities.

A Framework for Market Segmentation Decisions

A general process will be introduced for segmentation decision making. While not as comprehensive or exact as would be ideal, this framework at least suggests a defined process for segmenting industrial markets. It also forces managers to at least consider some of the cost implications of various strategies.

The General Case

There is only one reason for a firm to segment a market: to increase profit over what it would have been without segmentation. As shown in Figure 1, the right-hand, S-shaped curve is the sales response function for an entire market (M). The threshold level of marketing expenditures before any sales revenue appears is shown by the marketing effort E at the value of $^{E}M_{t}$. The profitable range of minimum $(^{E}M_{min})$ and maximum $(^{E}M_{max})$ marketing efforts in which marginal revenue exceeds marginal cost are shown on the horizontal axis to give the range of sales revenues (R) from $^{R}M_{min}$ to $^{R}M_{max}$.

However, it is generally not feasible to aim at the entire market. Assume that of all possible market segments, the firm selects (based on some criteria) market segment A shown at the left in Figure 1 with the threshold level of marketing expenditures and ranges of profitable operations as given. Examples of criteria the firm could use to select this segment are its revenue potential (reflected in the segment's size and expected growth and the firm's competitive position in that segment), the cost of reaching the segment, and its compatibility with the organization's objectives. Sinclair and Stalling (1990) suggest the use of attribute analysis in this process when segmenting industrial markets. This approach helps identify important product attributes between segments.

In the general case, the process of market segmentation and focusing the firm's efforts on segment A have significant

advantages: (1) the threshold level of marketing effort at which sales revenue starts appearing is lower ($^{E}A_t$ versus $^{E}M_t$) and (2) the level of marketing effort at which profitable operations occur is also lower ($^{E}A_{min}$ versus $^{E}M_{min}$). However, Figure 1 shows that larger profitable sales revenue can be generated from the entire market ($^{R}M_{max}$) with the shapes of the sales response functions shown.

How can the firm achieve this greater profitable sales revenue available from the entire market? One of the obvious alternatives is to find a second segment to penetrate. The sales response functions for each potential market segment can be ranked according to expected profitability. Figure 2 shows the sales response functions for both segment A (described earlier) and segment B, the next most profitable segment. The marketing manager's decision to gain additional revenue by moving into segment B involves the tradeoff between (1) operating in the flattening, but profitable, range of the sales response function for segment A and (2) paying the high threshold expense associated with new segment B in order to reach the steeper, profitable portion of its sales response function.

Threshold Costs and Number of Segments

Threshold costs occur due to the unique needs of the new segment--marketing actions such as a new product, an entirely new sales force to reach the segment, or new advertising copy. A basic premise of this paper is that an understanding of the size of these threshold costs and ways to reduce or avoid them through synergies or scale economies should be central to a marketing manager's decision but is missed through conventional segmentation approaches.

There are, however, situations where threshold costs may be minimal. If new price-sensitive segments are added by successive price reductions through time, no or few additional threshold costs due to new product, new sales force, or new advertising copy are incurred. In geographic segmentation, a new product rollout into new regions in the same country probably does not involve new product or new advertising copy threshold costs but certainly incurs additional sales force, advertising media, and distribution costs.

In the general case, however, where the threshold cost of reaching a new segment is significant and where segments are ranked by potential profitability, each successive segment added contributes less profit. The result is that a firm encounters a potential limit of distinct segments that it can reach profitably unless it can take advantage of important synergies or scale economies.

One-Product and Multi-Product Segmentation

Table I is a representation of a discrete market-product space for a single product that might be sold to a number of alternative market segments. Assume that the sole product P, is initially sold to its most profitable market segment M that appears as market-product space $M_2 P_1$ in the figure. In this simple case, if the firm is able to reach other market segments like M_1 and M_3 through customer self-selection (Frank, Massy, and Wind, 1972, p.7), it can avoid incurring the high threshold costs that often preclude adding new segments. An example is when the same advertising campaign for an inexpensive diet drink reaches not only a weight-conscious segment (say, $M_2 P_1$) but also a price-sensitive segment as well (say, $M_3 P_1$). In other words, different segments seeing the same advertisement are reached simultaneously. In the more typical case, however, significant threshold costs are incurred in reaching new market segments even with the same product.

Wind and Robertson (1983) note the importance of recognizing market (or sales) response functions and synergies in market segmentation studies. However, they discount the value of product-market matrices like those used here in studying synergies, instead recommending a "positioning analysis". An opposing view is that the market-product structure is more useful because it enables often vaguely defined synergies to be clarified and better visualized.

We can define four synergies that must be assessed in decisions to reach additional market segments:

1. R = revenue effects of adding new segments. These are likely to be positive if a new product reaches a completely new segment of buyers. They may be negative for substitute products if the new product simply cannibalizes sales from old customers who were paying higher prices. In contrast, for highly complementary products, revenues may increase not only from the new product offering but from increased sales of old lines (a bank adding insurance or mutual funds increases its revenues from existing customers already using its saving and checking services).

2. D = research and development costs of offering a new product. These are zero if old products reach new segments but are significant if a totally new product is offered.

3. M = manufacturing/operations costs of producing a new product or increasing the sales of an old product. New tooling and production costs are

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significant for a new product. In contrast, experience curve and scale economy effects may significantly reduce unit manufacturing costs if existing products are produced in greater volume to reach new market segments.

4. S = marketing and sales costs of taking a new product into existing or new segments or an existing product into new segments or more intensively into existing ones. Adding a new product for existing markets usually doesn't involve major marketing expenses. In contrast, reaching new segments--with either existing or new products--may involve significant marketing costs.

Table II expands the segmentation problem to a multi-product market-product space. Assume the firm is selling product P_2 to market M_3 (market-product space $M_3 P_2$). In seeking additional profit, the firm can move in any of the directions shown by the arrows and also diagonally. For simplicity, assume it offers substitute products and is considering only segments 1, 2, and 3 as follows:

1. Seeking revenue from new market segment (M_2) with new product (P_2)
2. Seeking revenue from existing market (M_3) with new product (P_3)
3. Seeking revenue from new market segment (M_2) with new product (P_3)

The probable synergies in terms of revenue and cost of these three strategies are summarized below, where ++ = very favorable, + = favorable, 0 = none, - = unfavorable, and -- = unfavorable.

An analysis of this table and Table II suggests that significant scale economies (1) for R & D and manufacturing run down the columns in Table II and (2) for marketing run across the rows in Table II. This implies that segmentation decisions cannot be made in isolation by a marketing department without considering R & D and manufacturing/operations implications. Useful analytical market segmentation techniques must be able to capture these major synergies. Table II also reveals the danger of a "diagonal" (new market, new product) strategy because the firm is dealing with new unknowns in both (1) R & D and manufacturing on the one hand and (2) marketing on the other.

	Strategy		
Synergy	New Market Old Prod.	Old Market New Prod.	New Market New Prod.
1. R : revenue	+	++	++
2. D : R & D	0	--	--
3. M : manuf.	+	--	--
4. S : marktg.	--	-	--

The Realities of Segmentation Decision-Making

The problems with this approach become apparent when an attempt is made to operationalize it. Green and Krieger (1991) suggest a method based on conjoint analysis, but admit that cost estimations and measurement problems are formidable. Mahajan and Jain (1978) recognized these problems with normative segmentation over a decade ago. Recently other authors (Sinclair and Stalling 1990; Laughlin and Taylor 1991) have proposed methods to specifically handle industrial segmentation, but cost tradeoffs are not explicitly considered. In their review of applied segmentation articles, Rudelius, Walton, and Cross (1987) found that costs are considered when translating research into strategy in only about half the cases.

Add to this possible organizational behavior problems and the task becomes daunting indeed. Managers likely emphasize the pragmatic aspects of segmentation and may disregard techniques which don't offer obvious suggestions for profit improvements. They may also not be inclined to pay for segmentation research if they sense the organization would resist changes in the firm's current strategy anyway. The amount of uncertainty in their decision environment may be so great that added research may not be seen as worth the cost. These traits could lead managers to draw implications from data and induce decisions which contain significant pitfalls.

It would be instructive to learn what percentage of industrial segmentation decisions 1) itemize the various cost items, 2) try to quantify them, and 3) do some sort of tradeoff analysis. Quite possibly some of these strategies are volume driven with little consideration of profit and loss. Since so little is known about how the translation of research into strategy actually occurs, a study of these practices is being conducted by the authors. The issues to

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be examined include 1) how managers actually perform the translation, and 2) how they should do it to incorporate the cost considerations which have been discussed here. So the research will progress from positive to normative, with the first step aimed at quantifying current methods. The results of this survey should at least illuminate what criteria industrial marketers consider and actually use when segmenting markets. These results may suggest other appropriate techniques to use to capture some of the revenue/cost tradeoffs which are present.

Much has been written about segmentation and various methodologies since Smith's (1956) seminal segmentation paper. One of the areas which has been neglected and deserves more attention is the role costs play in segmentation decision-making. At a minimum, the authors recommend that marketing managers itemize the various costs that are present. Then decision makers at least have to consider them. If they can be quantified, a more explicit cost-benefit analysis can be performed. This might be a first step in overcoming organizational resistance to certain strategies which may deviate from the status quo. Actually, this type of exercise would be beneficial in any segmentation decision. It would force the organization to examine the basic notion in segmentation: efficiencies which increase profits.

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Table I - Market-Product Space for One Product

Market Segment	Product P_1
M_1	↑
M_2	M_2P_1
M_3	↓
M_n	
Total	

Table II - Multi-Product Market-Product Space

Market Seg.	P_1	P_2	P_3	P_n	Tot
M_1					
M_2		↑			
M_3	←	M_3 P_2	→		
M_n		↓			
Total					