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Market Segmentation in the 21st Century: Discrete Solutions to Continuous Problems

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Abstract

Market segments exist because of information and cost constraints If manufacturers had accurate individual-level demand information and the ability to produce and deliver unique products at low cost, then individual customization of products would be a viable market strategy But as uncertainty about consumer demand increases and/or the cost of customization increases, firms find it more profitable to reduce the variety of the products they offer This paper reports on a critical examination of trends in the analysis of customer data and in reductions in the cost of customization brought about by innovations such as the Internet and flexible manufacturing systems We conclude that recent trends are not sufficient to support individual customization in most product categories However, despite the inability of these trends to support individual customization, we predict several changes in the dimensions surrounding successful segmentation strategies that will be used by firms in the future

1. Introduction

Recent developments in our ability to measure consumer demand and to customize aspects of the marketing mix at low cost have allowed firms to cater to smaller and smaller market segments. Third party delivery services such as Federal Express have revolutionized product distribution, while small-batch

production processes in firms such as Levi Strauss make the concept of affordable individual customization a reality. In theory, the availability of accurate information about a particular consumer's demand function, coupled with minimal scale economies, can lead to segments of size one being profitable (see Kotler (1997), and Pine (1993)). However, as information about consumers becomes vague and the cost of customization becomes large, segments of size one no longer remain profitable.

The purpose of this paper is to examine critically the factors which enable a firm to fully customize its product offering and cater to segments of size one, as opposed to offering a limited selection of product offerings, catering to groups of consumers. In a cost free world, we regard full customization an ideal state assuming that consumer demand (i.e. preferences and sensitivities) is heterogeneous and follows a continuous distribution. However because of information and cost constraints, a firm may find it more profitable to offer a discrete 'solution' in which segments are larger. Therefore we regard the process of market segmentation as an approach which offers a discrete solution to a continuous problem.

We explore the changes taking place in the technology and information management fields and examine how these changes can aid marketers in getting closer to the ideal condition of segments size one. These changes include the availability of customer purchase records (made possible by bar coding technologies and continuing improvements in data processing), improvements in our ability to analyze these data; reductions in the cost of customization; and the ability to communicate directly with the customer through new channels such as the Internet.

The organization of the paper is as follows. Section 1 lays the groundwork for our discussion by providing a definition of a market segment and discussing current methods of segmentation. A simple economic model of consumer choice is introduced which brings together aspects of demand and supply, both of which are critical to our definition We argue that precise estimates of consumer demand, coupled with minimal scale economies, are necessary conditions for full customization to be profitable. Issues in measuring customer demand are then

discussed in section 2, and supply side issues are examined in section 3. We examine whether improvements in production, distribution and communication will likely be sufficient to support individual customization strategies. Our conclusion is that while market segments will certainly be smaller in the future, full customization will not always be viable. Equally important, we expect the basis of competition to change as the amount of customer information increases and costs decrease. Section 4 provides a discussion of the strategic implication of operating in information rich markets with minimal scale economies

2. Definitions and Organizing Framework

To organize our discussion of market segmentation, we make the standard assumption that consumers maximize utility subject to constraints on their time, money and various forms of effort (physical, mental, psychological, etc.). We assume that consumer marginal utility for a product can be reasonably approximated by a linear model of product features and the importance associated with those attributes given a consumption situation (c.f. Mazis, Ahtola and Klipper (1975)).

$$\begin{aligned} \text{Marginal Utility} &= x' \beta \\ &= x_1\beta_1 + x_2\beta_2 + \cdots + x_k\beta_k \end{aligned} \tag{1}$$

where x_i denotes the level of feature "i" and β_i denotes the importance of the feature to the consumer. We assume that the product offerings under consideration by the consumer are essentially substitutes in that they help the consumer solve the same problem. These standard assumptions lead to consumer demand defined by:

$$\begin{aligned} &\text{Select product offering with greatest } x' \beta/\text{cost} \\ &\quad \text{iff } x' \beta/\text{cost} > \text{threshold value} \end{aligned} \tag{2}$$

Demand functions of this type can be formally derived from an economic model where the assumption of weak separability is made between goods within the product class and all other

goods (see Hanneman (1984)). In this framework we assume that consumers will opt not to purchase any of the products if the marginal utility to marginal cost (value or "bang-for-the-buck") does not exceed a threshold value. If more than one of the products has value ($x' \beta$/cost) greater than the threshold value, then he or she is assumed to select the item for which $x' \beta$/cost is greatest

Within this framework we take the firm's perspective and define "product offering" as the extended product which includes the core product plus all aspects of service, distribution and communication (see also Mahajan and Jain (1978)). Thus we regard two functionally identical core products as different if they are purchased by different methods (1-800 versus storefront retail), or are distributed differently, or if the benefits are communicated to the market in different ways. The marketing efforts needed to support any of these differences results in different production functions for the firm, different costs, and as a result, a different product offering. From the consumer's perspective, some of these firm-level activities enhance product features and/or alter the importance of these features ($x' \beta$), while other activities reduce the cost of consumer acquisition and use (cost). For example, a thirsty consumer may be willing to pay extra for a cold soda at the local convenience store because his or her state of thirst has increased the marginal cost of time to the point where acquiring the product quickly is valuable. While the core product is the same as the soda in the refrigerator at home, the extended product is different because the soda at the convenience store is immediately available.

We define a market segment as a set of actual or potential customers. The use of the term in the marketing literature grew out of the creation of such customer groupings for the purposes of designing and implementing marketing strategy. The reason for such groupings is that marketers have been unable to respond to the individual differences that exist in the market place. Therefore, they have used groups of individuals to reduce the number of distinct customer types under study In this process, the members of the groups are assumed to be sufficiently homogeneous that product offerings targeted to the groups will be more attractive to the group members than

competing offers

Over the decades, the marketing literature has moved from viewing market segments as marketplace phenomena to viewing them as management tools (Smith (1956), Dickson and Ginter (1987), Lehmann and Winer (1997)) This view has several implications. First, it means that a particular grouping of individuals (segmentation scheme) may be unique to a particular strategy (see Day, Shocker and Srivastava (1979)). Clearly, there is no reason to expect that different market offerings having different management strategies would be necessarily targeted at the same customer group. There is also no reason to expect that firms with multiple offerings would, or even should, view the market similarly for each offering. Both the way a firm views the market and the selection of target groups within the market should be specific to their use, i.e. to the development and implementation of a marketing strategy for a product offering.

In our view there is no single natural or best partitioning of the market. That is, market segmentation is a management tool that may be tied to strategy in various ways. Target markets, for example, are market segments selected as the object of a marketing program. The achieved segment for an offering may be that set of customers who actually purchase it. Similarly, marketers cannot expect to be able to reach global evaluations of different bases of segmentation. Many marketing texts have offered their criteria for segments or bases of segmentation. In our view, the criteria must be driven by the intended use of the segment structure (see also Wind (1978), Dickson (1994: 109)) If it is to be used to target communication, then it may be extremely important that the segments differ in their responsiveness to media or messages. The point here is that since segmentation is a tool, the bases for deriving these segments must be evaluated in terms of their ability to achieve the organizational purpose for which the tool is intended. Therefore, global or generic statements about segmentation criteria are unable to reflect these specific objectives of segmentation value in a particular setting.

2.1. Approaches to Segmentation

There are currently two basic approaches to market

segmentation. The distinctions can be seen by referring to a simple, general model of behavior that begins with general psychological constructs (e.g. personality traits, basic values) which are then focused on a product category (e.g. through attribute importances, conjoint part-worth utilities). These product category specific constructs are then combined with product perceptions (e.g. attribute levels, product/service features) to form preferences. Preferences affect behavioral intentions, which, in turn, affect behavior in the form of product purchase and choice from alternatives. A common assumption with either approach to segmentation is that natural groupings of consumers exist, whose responses to marketing programs will be homogeneous. The difference between the approaches comes from to the starting point of the analysis.

In the first segmentation approach, analysis begins with the specification of a set of psychological constructs and assumes that groups of customers who are homogeneous on these constructs will have similar preferences for product features and marketing programs (see for example Vriens, Wedel and Wilms (1996), and Kamakura (1988)). Further, it is assumed (or hoped) that customers with similar preferences will exhibit similar market-place behavior (see Green and Krieger (1991), and Krieger and Green (1996)). In this approach, customers are grouped either according to their measured preferences and part-worths (i.e. benefit segments) or by covariates (e.g. demographics, product usage) which are associated with these preferences.

The focus of this approach is on the weights given by consumers to various attributes of a product, and not on their perceptions of product features. It is assumed that groups of consumers exist, whose tradeoffs for attributes within a product are relatively homogeneous, and that all consumers have the same perceptions of each brand's attributes. However, if similar groups of individuals do not exist, or if the same advertised features are interpreted differently by individuals in a group, then the identification of an optimal (extended) product offering is more difficult because of uncertainty in predicting eventual consumer demand. For example, an advertisement for a knife that never needs sharpening could be viewed as a great convenience to novice cooks but a problem for experts who

require honing to their exact specifications.

The second general approach to market segmentation begins with actual behavior. The assumption is that differences in behavior are due to underlying differences in preferences and (hopefully) the underlying psychological constructs. Behavioral measures are taken at the individual level and linked to product attributes and covariates useful in identifying customer groups. This relationship is obtained, for example, by introducing interaction terms in the demand equation between demand parameters and variables that provide a useful basis of segmentation (see for example Bucklin and Gupta (1992), Gupta and Chintagunta (1994)). For example, brand intercepts in a choice model can be related to product attributes, and price sensitivity coefficients can be related to household income and employment status. The advantage of this approach is that it leads to actionable information about current market dynamics and can be used to guide tactical decisions such as media and channel selection. The disadvantage is that it is frequently not possible to examine motivational aspects of consumer behavior (see Fennell (1978)) which are useful when considering more strategic problems - i.e. patterns of past behavior alone may not tell us how the customer will respond to a new product offering. We are much better able to make such a prediction if we understand the motivations and values underlying the past behavior and apply these motivations and values to the proposed purchase setting

The use of market segments and market segmentation strategies to approximate individual differences in the marketplace will change in the future. Previously, marketers could not understand demand characteristics at the individual level or target many of their marketing efforts at the individual level So, they used groupings of individuals. Changes in research, marketing and production methods have enabled us to work with smaller and smaller groups without excessive cost. To illustrate, consider what happens to the size of market segments as (1) marginal utility ($x' \beta$) and threshold values are measured more and more precisely, and (2) economies of scale are driven closer and closer to zero. In the limit, the first point implies that the consumer demand functions are exactly revealed to producers while the second assumption implies that no

additional costs are incurred by catering to a smaller market segment. As uncertainty and scale economies are driven toward zero, it becomes feasible for firms to cater to smaller and smaller segments In the limit, segments of size one result as products are produced to the exact specification of a particular consumer, at no additional cost to the firm, and, at a cost the consumer is willing to pay.

Consider a firm that is currently manufacturing a product with a known demand curve. The firm now considers introducing a second version of the same product in an effort to segment the market. Should it offer this version or not? The firm will estimate demand for the new product and will calculate the expected increase in revenues after the introduction. The firm will also calculate the costs of generating the new product, including both fixed and variable costs. If the expected increase in revenues exceeds the incremental costs, a risk neutral firm will introduce the new product. However, if the decision maker is risk averse, then the expected revenues must exceed the additional costs by a margin that is a function of the certainty of demand. The more uncertain the firm is about demand, the less likely the expected revenue increase exceeds the incremental costs by a large enough margin. Therefore, a firm is less likely to

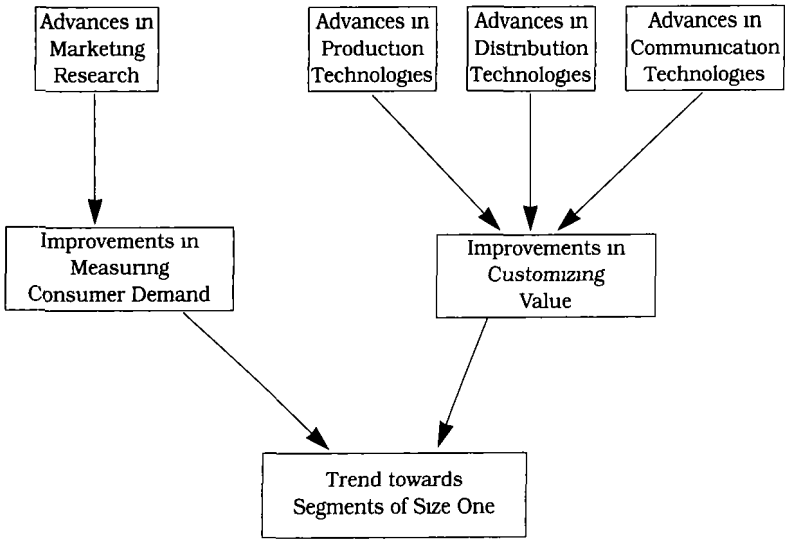

Figure 1. Overview of Analysis

increase the number of segments in the market when demand is less certain and when the cost of generating the new product is higher.

Figure 1 provides an overview of the remainder of the paper. In the next section we begin with issues in the measurement of consumer demand, followed by a discussion of the ability of firms to customize products. We believe that while there have been many recent advances in measurement of demand functions, there exist tremendous obstacles in obtaining precise estimates of many key components of the demand curve. Uncertainty will therefore not always be driven to zero to facilitate individual customization.

3. Measuring Consumer Demand

Consumers are different from each other. This basic notion is fundamental to the field of marketing and is the basis of all segmentation strategies. Over the course of the last 30 years, great strides have been made in attempting to measure aspects of consumer demand functions. For example, it is now possible to obtain fairly precise individual-level estimates of part-worths in conjoint settings (Green and Srinivasan (1990)) using various hybrid (Green (1984)) and Bayesian (Allenby and Ginter (1995)) methodologies. These methodologies employ definitions of consumer marginal utility similar to equation (1) above, where part-worths correspond to the β_i's and dummy variables (coded 0 and 1) are used to represent levels of product attributes (x_i).

However, despite these advances, the measurement and application of consumer demand functions for the practice of market segmentation does not provide all the information required to predict demand. The reason is that the development of measurement methodologies has tended to focus on part-worths (β) given a stated level of a product feature (i.e. β given x). It has largely ignored how consumers view the products (perceptions of x) in the first place or whether everyone employs the same decision rule to obtain a overall evaluation (see Gensch (1987), Kamakura, Kim and Lee (1996)). A primary exception is the literature on perceptual mapping which has recently attempted to relate perceptions to demand functions (see

DeSarbo (1994), Chintagunta (1994), and Erdem (1996)). However, these approaches based on observed demand need to restrict the variation of β to identify the perceptual space of x. Alternatively, perceptual maps can be obtained from approaches that begin with consumer attribute ratings, but these approaches are also limited in their ability to deal with heterogeneous perceptions about the attributes and their meanings (see Steenkamp, Van Trijp and Ten Berge (1994)).

Consumers who are experts understand how to link attributes to desired benefits. Computers have Pentium chips, cars have 4, 6 or 8 cylinders, and food labels inform us of the specific nutritional make-up of a single serving. Experts have the capability to translate these specifications into the specific benefits they represent. Examples of benefits include the researcher or analyst's efficiency when using the Pentium chip to quickly solve complicated problems, the safety of merging into fast traffic, or whether a particular food product will satiate hunger without exceeding a person's desired calorie intake for the day.

Consumers who are not experts do not know how to evaluate attributes. Instead, they understand the benefits they desire. They are unable to translate from product attributes to product benefits because attributes have less meaning to them. For example, a non-expert consumer has no idea whether a camcorder with a minimum light rating of 10 lumens will do a good job of faithfully recording a twilight birthday party. A firm wanting to market its product to experts and non-experts will need to recognize this difference and develop different communication strategies for the two groups, and perhaps even different pricing and distribution strategies. Hence, the extended products are different even if the core product is identical, which results in multiple market segments.

A consumer's belief that a given brand contains a given level of an attribute is an equally important consideration. Until recently (Mackenzie and Spreng (1992), Day and Wensley (1988)), segmentation researchers have not allowed for the possibility that people's beliefs might themselves become a basis of segmentation because the same communication might result in different attribute beliefs in different people. Thus, people's attitudes and intentions are a function not only of the attributes

that they consider important, but also of the meanings they derive from, and the beliefs they form about the brand.

In practice, portions of questionnaires are devoted to having respondents indicate on a five or seven point scale how particular products perform on particular dimensions. These data are then assumed to be interval-scaled and multiplied by conjoint part-worths (β's) to obtain estimates of marginal utility. The state of research in this area is very primitive in that methods of dealing with issues such as scale compression (e.g. the tendency for some consumers to only use a portion of the scale range, regardless of their true beliefs) are very crude. Hence, it is difficult to obtain statistical measures of true underlying perceptions.

Recent research measuring the extent of heterogeneity in consumer demand functions (Allenby, Arora and Ginter (1998)) supports the assumption of a very heterogeneous population. Results indicate that the distribution of heterogeneity is continuous and not discrete or distinctly multimodal as is often suggested in the statistical segmentation literature (Kamakura and Russell (1989)) or in most marketing management textbooks (see for example Kotler (1997: 250)), Churchill and Peter (1995. 290), Cravens and Lamb)1990: 225)). An exception is the work by Claycamp and Massy (1968) and Frank, Massy and Wind (1972) who propose methods of determining segments when preferences are continuously distributed. Recent studies by Allenby and Ginter (1995, table 2) and Arora, Allenby and Ginter (1998, table 3) indicate that individual-level estimates of consumer demand functions are often imprecise, with the majority of parameters (β, threshold values) not statistically significant.

The inaccuracy of individual-level estimates of consumer demand curves is primarily due to the small individual sample sizes available in most surveys and household purchase histories. Household purchases in most product categories often total less than 12 per year. Similarly, survey respondents become fatigued and irritable when questioned for more than 20 or 30 minutes, leading to questionable data quality in lengthy surveys. As a result, while there may be many consumers in a particular study, the amount of data available for drawing inferences about any specific consumer is very small.

An alternative approach that provides limited customization and removes the need to measure individual demand functions is to simply offer a menu of product features and let consumers pick and choose those features which are most important to them. This strategy will work if there are minimal scale economies to communication, production and distribution. However, when these economies are present, firms must restrict the number of menu items or product alternatives offered to keep costs down. They must therefore decide what to produce (and what price to charge), and the issue of accurately measuring consumer demand once again becomes important.

It is our opinion that without substantially greater consumer participation in specifying what product characteristics are desirable, individual customization will not be a viable strategy in most situations. Sufficient individual-level information does not exist at this point to yield accurate estimates of consumer demand functions. Therefore firms cannot rely solely on records of past customer behavior to identify an optimal product configuration for each customer. Instead, firms must engage in activities that alter the value of the product to achieve greater customization. These issues are discussed next.

4. Customizing Value

Technological advances in distribution and communication, such as the Internet, and flexible manufacturing systems in production, will continue to reduce the cost of customization. As the cost of communication, manufacturing and distribution decline, the strategy of catering to smaller segments by providing value through customization becomes a viable alternative. We organize our discussion of customizing value around the traditional marketing decision variables.

4.1. Price

Applying the individual customization concept to pricing would theoretically result in a firm charging a different price to each consumer, where that price is the consumer's willingness to pay or threshold value for the product. If a consumer's utility

function were exactly revealed to a firm, it may be possible to devise an optimal price that would extract all available consumer surplus and maximize profits. This perfect price discrimination (Tirole (1989)) would result in segments of size one because the product offering would be uniquely determined. Automobile dealers attempt this by using external cues and information collected from the customer prior to negotiating the price for a vehicle. However, this type of price discrimination is difficult to achieve because there is no incentive for consumers to reveal aspects of their demand function, such as their threshold value. Without consumer participation, this approach is not feasible because of the limited amount of individual-level information that is available.

Traditional approaches to segmented pricing have instead relied on various self-selection mechanisms that allow consumers to trade-off one aspect of a product's cost for another. A limited number of products and prices are typically made available and consumers are free to select the alternative they value most. These mechanisms often exploit relationships between a consumer's sensitivity to price and other components of cost. For example, coupons allow consumers with low cost of time to reduce the price paid relative to consumers who have less time to devote to the tasks of clipping and redemption. Volume discounts rely on a tradeoff between price sensitivity and the cost of handling and storage, and convenience stores can charge higher prices than wholesale clubs because they cater to consumers who are willing to pay extra for lower acquisition costs.

Although it is unlikely that firms will ever be able to determine each individual's willingness to pay and then charge him/her that amount, technology is enabling firms to identify behaviors and characteristics of price sensitive consumers with increasing accuracy. In this environment, a firm's ability to identify customers with varying price sensitivities, and to selectively offer them different prices become key success factors. Catalina Marketing offers point-of-sale coupon systems that use a consumer's current purchases, a behavior linked to price sensitivity (Rossi, McCulloch and Allenby (1996)), to determine which coupons are printed for that individual consumer. Similarly, magazine subscription renewal rates are partially

determined by characteristics of the subscriber that correlate with the likelihood of renewal. In both of these examples, a special offer is made only to consumers who behave in specific fashions and not to everyone. The more information firms gather about consumer price sensitivity and how it correlates with other behaviors and characteristics, the smaller targeted segments can become. The result is a range of substantial deals offered to selected targets rather than one shallow deal offered to everyone.

However, we believe that there are many impediments to charging different consumers different prices. First, in instances where price information is easy for consumers to obtain (e.g. Internet shopping), price matching should become a more prevalent strategy. Second, there exists a substantial social risk of consumer resentment for being charged a different price for the same physical product if such pricing practices are discovered. While societal norms that determine fair pricing practice will certainly change over time, it is doubtful that consumers will ever fully embrace a firm's rationale for extracting their surplus. Third, the data storage and computational costs of deriving optimal prices for each individual are very large and hence this practice is not economically viable in many product categories.

We believe that in the future, firms will establish multiple self-selection mechanisms, or menus, of features and prices, and actively expose a particular consumer to only one. The data requirement for this approach is less than that needed to implement a fully customized pricing strategy since it is only necessary to identify the customer type and not obtain unique estimates of all demand function parameters. In addition, this approach is more socially acceptable than full customization because consumers are given an array of prices and features from which they can choose.

4.2. Product

The incentives for firms and consumers are aligned when segmenting based on product attributes. Consumers want the product that gives them the most value and firms would like to design and produce that product for them. As scale economies of

production decline, it becomes feasible for firms and consumers to work together to produce high value products. For example, some music stores now allow customers to assemble their own CDs, picking between songs by different artists and arranging them in the order they prefer. These customized products have high value because consumers have high utility for each of the songs on the CD and not just a few as on a pre-recorded CD.

It is doubtful that flexible manufacturing systems will ever progress to the point where it is profitable for firms to produce a unique product from raw materials for each buyer. However, we do believe that the on-demand assembly of products from component parts can become a viable alternative in some industries. Inventorying product components and assembling products on demand has already become a standard practice in industries where time and/or variety is a critical dimension of competition. Fast-paced technological advances in the computer industry make it economical for firms like Dell and Gateway to work with minimal finished goods inventories that have a high risk of becoming obsolete if not sold quickly. Fast food restaurants like Burger King encourage customers to 'have it your way,' and kitchen remodeling companies have access to broad inventories of cabinetry for consumers to mix and match styles. For some products, such as paints and perfumes, it is possible to offer an infinite variety of alternatives to the customer at little or no extra cost. The Body Shop, for example, allows a customer to choose a non-fragranced basic product, such as a body lotion, and then to add a fragrance at the time of purchase from a large variety of choices that can be sampled in the store.

The assembly of products on demand results in greater product variety, greater customer value, and smaller segments. The success of this approach depends on factors such as codified standards to enable inter-changeable components to work together, and consumer involvement and/or expertise in identifying desirable components. In addition, the use of components is consistent with the use of the self-selection pricing mechanisms discussed earlier, where each component is priced separately. We therefore believe that component-based assembly of products on demand will become more prevalent in the future as the next step toward producing fully customized

products on demand.

Our discussion of products to this point has focused on situations where the customer's role is one of specifying what he or she desires in a product An interesting departure is the case of services where customers take on active roles in the actual production process. Because of this need for customer participation, services have historically been customized to some extent. In many service settings such as education, psychological counseling or home decorating, the customer acts as a co-producer along with the service provider and can create a unique product (see Mills and Morris (1986)). Segmentation strategies for service providers will therefore focus on allowing customers to select the extent of co-production activities, in contrast to goods where the focus is on the selection of product attributes.

4.3. Distribution

Distribution channels have evolved over time in order to afford consumers the ability to purchase products when and where it is convenient, rather than when and where the product is produced. Such convenience reduces the cost of acquisition for the consumer. As geographic segmentation continued to progress as a means to target customers, channels of distribution for many goods have become more complex with respect to structure and numbers of intermediaries. We believe that as we move to the next millennium, two factors - component based production and the Internet - will dramatically affect the way many products are distributed, and therefore, change the structure of the distribution channel

As discussed above, component-based production (CBP) involves building a product to an individual's exact specification Component based production is currently in its infancy, but as it becomes more widespread the time and place benefits of the traditional channel, as well as the service of sorting/rating/ assorting, will be diminished. This is especially true for consumers who know exactly what they want to buy. We see CBP creating a shift toward inventorying product components that are assembled on demand rather than maintaining large finished goods inventories. This will result in retail outlets that

are much smaller, since it will no longer be necessary to stock a huge variety/assortment of finished goods at the point of contact (purchase) with the consumer. It is our view that such a trend will result in a degree of segmentation that will likely be much finer (e.g. more store locations) with the result being even smaller geographical market segments Of course, the viability of CBP at any point in time depends on the relative costs of decentralized versus centralized assembly. As the marginal cost of decentralized assembly decreases the profitability of CBP will increase.

Christina's of Montreal, a swim-wear-shop, provides an example of CBP. Christina's historically distributed completed goods (a line of swim-wear) through traditional channels selling a limited assortment through large retailers such as JC Penney, Sears, and WALMART. Christina's has recently opened small retail shops that sell customer-fitted bathing suits which are made to the exact measurements and specifications (style, material, accessories) of a customer. Rather than choosing from finished goods available at the store, the customer chooses from a large variety of sample fabrics available in the store (and via the Internet) and then designs her own swim-suit from a variety of patterns and combinations available. The finished product is delivered directly to the consumer's home via FedEx within 14-21 days, and one would only expect this time to shrink as production efficiencies and demand increase The result is a low cost retail store with limited space requirements, yet one which achieves the time and place function of traditional channels while delivering a highly customized product.

We would expect that this change to component based production will enhance the importance of the role of the retailers in acting as expert sources of information for products they sell, particularly for novice consumers. Merchants will be expected to not only offer product information, but also to help consumers find solutions to problems A swimwear retailer such as Christina's, would therefore not only provide information on fabric and fit, but might suggest swimsuits specifically designed for the customer's usage habits - whether the suit will be used for racing or just sunning, whether the customer will be in a chlorinated pool or the ocean and whether the customer would like to use the swimwear for other purposes, such as for

aerobics or as sports wear. We believe that consumers will focus on selecting merchants who are perceived as not just offering products that can meet their needs, but as actually helping consumers frame their problem and provide solutions. While this might increase the cost of the product, it will also result in a more highly customized/tailored product and one that better meets the needs of the consumer.

The Internet will also serve as one possible distribution, transaction, and communication channel, particularly for certain types of products and consumers (Peterson, Balasubramanina, and Bronnenberg (1997)). We believe that the Internet will simplify the channel of distribution for products that are not differentiated and/or for consumers who know what they want to buy or who buy only based on price. In such situations, order taking could be accomplished through a www (URL) address-center and delivery can be turned over to third party distribution services such as Federal Express/UPS/US Post Office so that the product is delivered directly to the customer at the exact place he or she wants to receive it. Dell Computer reports it has already reached $2 million per day in direct sales through its Web site (BRANDWEEK, September 29, 1997: 35) and companies like Amazon.com and CDNow are reporting their sales have doubled every month since they went on-line. Even in the fashion industry, companies like J Crew, Levi's, and The Gap are selling over the Internet and delivering next day through agreements with Federal Express.

The Internet could also provide strong benefits for consumers who are not first time buyers and who want to learn more about specific product features and/or other products that are available in the market. Given these consumers' knowledge and expertise, they would be able to search for the information they needed on the Internet. However, we believe that for novice consumers who have very little experience with the product and/or who need help in defining their problem and for consumers who require immediate delivery of the good, or for product categories where one desires to touch, feel or smell the product, the Internet will not be a strong substitute for the traditional retail channel.

4.4. Communication

The trend toward targeting increasingly narrow segments — with customized products, pricing strategies, and channels of distribution — has important implications for communicating with the customer. We examine three critical issues in this regard: the message, the media and the brand. While the 'brand' is part of the 'message' to be communicated, we discuss it separately to highlight strategic issues that are likely to be faced by marketers making brand choices.

Controlling the brand's image in the minds of consumers is an especially difficult task because in addition to receiving information about product features from manufacturers, consumers also receive information from sources that are not controlled by the firm. Consumers talk with each other, and obtain information from sources such as Consumer Reports. Inconsistent messages from any of these sources will quickly erode the cohesiveness of the marketing communication. Further, because brand images are influenced by the opinions of reference groups, marketers must monitor the shared meaning ascribed to their products by customers.

However, the fragmentation of the market into smaller and more clearly defined segments may actually help firms take a more active role in monitoring and controlling word-of-mouth and consequently, the meaning associated with their products. Given a smaller customer base, firms may more easily create and foster interaction among their customers either virtually (e.g., through company-sponsored discussion groups on the net such as DECUS-the Digital Equipment Corporation's Users Group) or through actual physical interaction (e.g., Saturn's Homecoming in Spring Hill) than is possible with traditional mass segments. Such forums afford companies an efficient way to monitor and react to changing customer concerns and preferences. Company-sponsored magazines (tailored to appeal to narrow customer segments) offer another avenue for marketers to influence customers' perceptions. By skillful placement of their products in features or stories, Neiman Marcus magalog is able to use less obvious 'hard-sell' to convey product image.

Technological advances allowing firms to target specific individuals afford greater flexibility in both what types of products are promoted to specific customers as well as what the message conveys. For example, the identification of individual computer accounts (cookies) logging on to a specific web-site may allow the firm to advertise products most likely to interest customers, given their past patterns of web search Or, information about customers' interests and expertise may be used to deliver emotional appeals by television to some customers and more rational ads to those individuals with greater involvement and need for specific facts.

As firms target increasingly narrow segments, there is likely to be a proliferation of brand names to support the development of distinctive product identities aimed at very narrow segments. Brand affiliations and images will continue to remain important because they will help consumers sort through the growing number of product offerings due to improvements in distribution and reductions in the fixed costs of production arising from reduced scale economies. There is clearly a limit to this process because of the cost of establishing a product identity. However, the very existence of many such brands may compel firms to develop an overall 'family' image for their offerings for two reasons. First, a family brand helps increase the efficiency of promoting to different segments. The efficiency comes from the family brand establishing the overall image of the firm (e.g., reliability, durability, etc.), reducing the marketing effort needed to establish the core characteristics of individual brands.

Second, as firms focus on narrower segments, they may become specialists in specific segments, seeking share-of-customer (developing a broad range of products to appeal to a narrow range of segments) as opposed to market share (developing a narrow range of products to appeal to a broad range of segments). A family image could facilitate the firm's cross-selling of its different product lines (e.g., a manufacturer selling shampoo might be able to offer conditioners, hair spray, or other personal grooming products) and permit more efficient communication of the core characteristics of a set of brands. Consequently, firms marketing many brands to very narrowly targeted segments may adopt a family branding strategy, with a common parent name being tagged on to individual brand

Table 1. Facilitators and Inhibitors to Customizing Value

Decision Variable	Facilitators	Inhibitors	Implications
Price	Measurement Improvements in estimating customers' price sensitivity and its correlates, using customers' past purchase records.	Measurement Limits to how much information can be gained from past purchases only Customers' unwillingness to reveal reservation prices Data storage and computational costs	Customization of pricing will be limited A firm's success in customizing price will depend on its ability to manage customers' purchase history information and to engage customers in a dialogue about their preferences
	Customization Availability of distribution outlets/formats facilitating charging different prices to different customers (e g , internet, catalogs)	Customization Improved customer access to comparative price information within a product category as well as across different customers Social Norms against price discrimination	Customers are likely to be offered menus of product features (e g , product attributes, quantity discounts, targeted promotions, bundled prices, etc) from which they can choose
Product	Measurement Improved measurement of part-worths associated with product attributes	Measurement Customer involvement in sharing information about desired product features	Given the costs of making to order, customization of products is likely to take the form of component-based assembly As more and more firms develop the capability to deliver similar or identical core products, successful firms will turn to the extended product offering to gain a sustainable competitive advantage
	Customization Production efficiencies, facilitating small-batch production Improved access to competitive, global sources of production	Customization Costs of making to order The lack of codified standards Patent protection	

Table 1. Facilitators and Inhibitors to Customizing Value (continued)

Decision Variable	Facilitators	Inhibitors	Implications
Distribution	Measurement: Improvements in measuring product movement, inventory management.	Measurement Channel members' unwillingness to share information, given a lack of trust	Given the component-based assembly of products, channel members will need to keep smaller finished goods inventories, resulting in smaller physical store-fronts
		Channel members' inability to share information due to inadequate integration of information systems	Customers will face a greater array of distribution choices, as more manufacturers take on direct distribution
	Customization Availability of third party delivery services Growth of internet commerce	Customization Some customers may seek the social aspects of the shopping experience Novice customers may need to physically inspect the product/seek the help of channel members prior to purchase Customer impatience Cost of decentralized customization	As the assortment function becomes less critical, given the ease of information exchange and distribution efficiencies, the retailer's role is likely to evolve to that of a problem-framer and problem-solver
Communication	Measurement Improved measurement of customers' media habits and responses to messages	Measurement Fragmentation of media makes it difficult to track audience characteristics Increased customer concerns over privacy in media usage information	Given the fragmentation of media, and the clutter of messages, firms may turn to company-sponsored media such as company magazines, special events for customers, etc to gain greater control over promotion
	Customization Improvements in production technologies and direct marketing allowing the customization of messages and media	Customization· The growth of non-commercial media makes it difficult to reach customers Customers may be able to build filters to screen the type of commercial messages they are exposed to (e g , on the internet), limiting firms' ability to break through Privacy concerns	To achieve efficiency in reaching customers, firms may use family branding strategies, establishing a brand hierarchy There is likely to be an umbrella family brand for the firm and a unique brand for each product line

names.

Table 1 provides a summary of the facilitators and inhibitors of customizing value. The facilitators work to reduce the size of market segments while the inhibitors act as barriers to full customization. Facilitators are listed in terms of factors associated with improved measurement of consumer demand and factors that reduce the cost of customization. The net effect of the facilitating and inhibiting forces appears in the right-most column of the table, and describes what we believe to be the likely implications for business practice in the next century.

5. Strategic Implications

We believe that the individual customization of products does not appear to be a viable alternative for most firms because of constraints on the ability to measure accurately consumer demand functions and constraints on the ability to produce extended products at low cost. While the variety of product offerings will certainly increase in the future due to systems such as component-based manufacturing, alternative distribution channels, and family branding strategies, there are many aspects of the extended product which involve inherently discrete choices. These include the components used to make up the product (e.g. songs on the CD), the physical location of retail centers, and the positioning strategies of the firm. We therefore believe that segmentation will continue to be a meaningful concept and an important strategic tool even though it is possible to address and respond to a segment of size one.

The competitive landscape of the next century will be affected by factors such as a continued reduction in scale economies, improvements in digital communication, and the ability to process quickly customer transaction data into useful knowledge. While this knowledge may never come in the form of the exact measurement of the consumer demand function, firms will come closer and closer to being able to produce exactly the variety of products that consumers desire at a lower cost. Geographic and capacity constraints associated with traditional channels of distribution will be relaxed, and firms will begin to have a better understanding of individual consumer demand

and associated aspects of purchase behavior

In this environment, it will become increasingly difficult for firms to compete for customers on the basis of their demand for core product attributes alone. Component parts will be available to many firms in the market and it will be easy for them to build nearly identical physical products. As geographical boundaries and other constraints are relaxed, consumers will have access to a wider variety of suppliers. We therefore believe that traditional segmentation methods based on consumer demand for core product attributes (β in equation 1) will be an ineffective basis for identifying and competing for desirable (i.e. profitable) customers.

Firms have traditionally competed by exploiting scale or scope economies to reduce the average cost of production. Both approaches spread out a firm's fixed costs We believe that the emergence of information rich markets with minimal scale economies will result in a much greater emphasis on scope. This is not just because flexible manufacturing makes scale less important. It is also because the availability of information will allow firms to get closer to the customer and provide products of superior value across multiple product categories.

However, as argued above, the use of customer purchase records is insufficient to completely understand the components of an individual's demand function needed to customize value. To obtain full customization, firms must proactively engage the customer to understand his or her motivations, preferences and perceptions. This is a costly task. It is not economically viable if performed for only a few customers or for a small expenditure per customer. However, successful firms will be able to reduce average costs by serving multiple consumption experiences Customers may prefer such an arrangement as well. Active sharing of information requires a large time commitment from consumers who are likely to be facing increasing demands on their time. Consequently, they may prefer to interact with providers who can service their needs across several product categories, minimizing the need to interact with multiple providers. Scope economies will therefore become even more important than they are today

We believe that a successful basis of competition in the future will be that of a solution provider. Firms will compete by

specializing in customer needs instead of products, and will vie for wallet share instead of market share. Solution providers will develop an in-depth understanding of customer demand and apply this understanding to multiple product categories. For example, while Christina's of Montreal currently offers custom fit swim-wear, this information is insufficient to identify the sports-, exercise- and casual-wear these individuals prefer. But if Christina's more fully understood how its product was used and what clothing styles their customers preferred, then it could become a provider of a broad range of apparel to the individual rather than specializing in swim suits.

Solution providers will compete for customers by enhancing the extended product This includes helping customers better define their problems, search for available solutions, acquire the product, and ensure that it performs properly. Customers will take on more of a co-production role, particularly in services where consumption and acquisition take place simultaneously Successful segmentation strategies will be based on the identification and retention of individuals with similar problems and perceptions (x, and threshold value in equation 1) in addition to similar preferences (β). This is in contrast to current segmentation methods that are based on consumers with similar demand for particular core product features and tend to focus solely on β. A more in-depth interaction with the consumer will be required. When successful, the result will be a deeper, more trusting relationship that will make it difficult for customers to switch firms.

Examples of this trend are already evident in industries where significant product differentiation is not possible. Manufacturers of packaged goods help retailers (their customers) manage entire product categories to enhance their presence on the shelf. Similarly, financial service organizations attempt to engage in financial planning discussions with their clients to better understand their concerns and recommend products. As physical products become less distinct, the importance of the extended product increases

Solution providers must be perceived by customers as being trustworthy, competent, flexible and enduring. The trust component ensures that customer data is used judiciously, and is not shared with other providers who might exploit that

knowledge (see also Smith and Cooper-Martin (1997)). Competence is necessary in order for the solution provider to engage the customer in problem definition, and to match the best solution to the well-defined problem. Flexibility will be a key component of competition because as a customer learns to depend on a solution provider, the customer may expect the provider to branch out into unanticipated problem areas. Finally, the solution provider must be viewed as stable and enduring, as the cost of "training" a new solution provider is very high. Solution providers who possess these skill will be able to overcome many of the privacy concerns potential customers have about sharing information.

We envision market segmentation in the 21st century taking on a richer and more realistic view of the consumption experience. Segmentation will consider all aspects of the consumer demand function (equation 2) in contrast to current approaches that concentrate on preferences for product features. This will result in a greater shift in focus from the product to the consumer In addition, firms will interact more directly with consumers to learn about their motivations and perceptions since these critical constructs are difficult to determine from observed purchase behavior. The resulting segments will be composed of consumers facing similar sets of problems (e.g. novices, experts, families with small children) who see value in partnering with a limited number of solution providers to help them accomplish their goals.

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