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Åbo Akademi School of Business

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Industrial Segmentation – A Review

Anna-Lena Majurin

Företagsekonomiska institutionen
Henriksgatan 7 - FIN 20500 Åbo

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Industrial Market Segmentation - A Review

Abstract

This article reviews some of the key published articles and literature, which have contributed to the present knowledge of industrial market segmentation, both empirical contributions as well as conceptual writings are reviewed. The development and theory of market segmentation and the central concepts of market segmentation are presented and discussed. The review first concentrates on the segmentation bases used in industrial market segmentation. The identification and choice of segmentation bases is considered to be one of the most crucial steps in the segmentation process, as it determines the outcome of the process. The most common approaches to industrial market segmentation, the two-stage model and the nested approach are presented in more detail. The current state of industrial market segmentation and implications for future research are discussed.

1. Introduction

As the heterogeneity and complexity of industrial (or business-to-business) markets has increased dramatically over the past decades and is expected to increase further, the segmentation of industrial markets can be seen as increasingly important for the survival and profitability of a company operating in such markets.

Although the importance of industrial market segmentation has been recognized for a long time, the publications explicitly on industrial market segmentation are mostly quite recent. The arena of consumer segmentation has thus been much better covered by researchers and already has a comparably long history. In the late 90´s a rise in the interest in industrial segmentation can be detected, though, by the increase of the number of publications on the topic.

Most of the research so far, has concentrated on the choice and evaluation of segmentation bases. Although the number of publications, both empirical studies and conceptual frameworks, has increased, there doesn't seem to be much consensus regarding these issues. This can also be seen by the seemingly fragmented and overlapping nature of the research.

There seems to be a need to review how the different segmentation bases have been treated by academics over the years. In order to give an overview, empirical studies and conceptual contributions will be reviewed from the perspective of the different segmentation bases and approaches that have been recommended.

1.2 The Purpose and Scope of this Review

The purpose of this review, which is based on previous publications, is to:

a) Place industrial market segmentation in a historical context and to review shortly the evolution of segmentation research

b) Explain some of the fundamentals of segmentation and the related concepts

c) Synthesize some of the conceptual and empirical articles published on industrial market segmentation

Industrial market segmentation is closely related to other topics such as organizational buyer behaviour (OBB) and the research in these areas often overlap. This review is focused mostly on publications explicitly on industrial market segmentation, although references to some other selected articles are made. This implies that articles, which have primarily focused on, for example, consumer segmentation, but have touched upon industrial market segmentation, have been omitted from this review. This is because they are not seen to significantly contribute to the conceptual or empirical knowledge on industrial market segmentation. The review is also limited to articles published in widely available and distributed journals, which are easy to find. It is very probable that there are many very good articles, which are unfortunately not included in this review due to the fact that they have been gone unnoticed to the author.

The central concepts of industrial market segmentation will first be defined and the reasons for segmentation will be discussed. The literature is then first reviewed according to the different segmentation bases, and then according to some of the general approaches to segmentation, which have been proposed in the literature.

1.3 Definitions of Key Concepts

Market segmentation "consists of viewing a heterogeneous market as a number of smaller homogeneous markets in response to differing product preferences among important market segments. It is attributable to the desires of customers or users for more precise satisfaction of their varying wants" (Smith, 1956, p.6).

A *segment* can be defined as "a group of present and potential customers with some common characteristic (s) which is relevant in explaining (and *predicting*) their response to a supplier's marketing stimuli" (Wind and Cardozo, 1974)

A *segmentation base* is "a key dependable variable on which firms can be assigned to segments" (Cardozo and Wind 1974). That is, the bases for segmentation.

A segment descriptor(s) on the other hand can be seen as the independent variable(s), which allows prediction as to where along the dependant variable a customer may lie, thus it is linked to segment membership. The descriptors are also used to describe the key characteristics of any one segment (Cardozo and Wind, 1974; Choffray and Lilien, 1980).

1.4 The Why and When of Segmentation

Segmentation can be seen as consisting of three stages: Segmentation, Targeting and Positioning: STP

There are a number of reasons of strategic importance as to why a company should segment the market it wishes to serve. Successful segmentation of the market will:

improve the knowledge and understanding of customers, partners and in the best cases, also the competitors

Based on the outcome of a successful and effective segmentation process, the company should be able to:

a) Ensure more efficient resource allocation as all the marketing-mix elements can be better focused on the target customers' specific needs

b) Prioritisation of the most profitable present and **potential** customer groupings, including the finding of potential new growth segments

c) Strengthen the competitive position of the company vis-à-vis the competition.

Decisions regarding which segments to target should be primarily based on the *potential profitability* of the customers, which belong to a specific segment as well as the *company's competence and strategic desirability* to serve those customers.

Segmentation is an expensive exercise for companies in terms of financial and time resources. It should, therefore, be recognized that segmentation should be carried out only if the overall market is heterogeneous and segments, which seek different benefits/ needs can be identified. The segments should also meet the criteria discussed below.

1.5 Requirements for Effective Segmentation

Six criteria have been proposed as criteria, which determine the effectiveness of the outcome of a segmentation process and the profitability of the resulting segments. The segments should thus be: identifiable/measurable, substantial, accessible, stable actionable and differentiable (Frank, Massy, Wind, 1972; Kotler 1994; Wedel and Kamakura, 1998).

Identifiable/measurable: refers to the degree to which marketers/managers are able to identify distinct groups of customers based on a specific segmentation base and the degree to which the segments size and profitability can be measured.

Substantial: the segments, which have been identified using a specific segmentation base, have to represent a large enough portion of the market in order to be profitable segments, worth targeting.

Accessible: managers have to be able to reach the identified segments through communication and distribution channels.

Stable: The stability criterion refers to the stability of specific segments over time. This criterion has not, unfortunately, received much attention so far.

Actionable: The company has to be able to formulate effective marketing programs for serving the identified segments

Differentiable: The different segments have to be heterogeneous in regard to their response to different marketing-mix elements. Within any one segment this response should be as homogeneous as possible. If two segments respond similarly to specific marketing-mix elements, they should not be considered two separate segments.

2. Theoretical Foundations of Market Segmentation

The theory of market segmentation is based on micro-economic price theory and has evolved from the pioneering work of Chamberlin (1933) and Robinson (1938) on perfect competition. Price theory explains the benefits of segmentation by explaining how a company selling a homogeneous product in a heterogeneous market could maximise its profits. Optimal profits can be achieved when the company takes advantage of the customer's marginal responses to price. Later the concept has been extended to use other variables than price, mostly promotional variables. Earlier, little product modification took place because the markets were still not very competitive. Today the results from a segmentation process should naturally lead to product/service modifications. As the global markets for products are extremely competitive, mere price discrimination or small promotional differences are not effective.

Segmentation theory can be viewed from two different theoretical perspectives: the behaviourist and the decision-oriented view. The behaviourist view is concerned with the questions of why customers are different and why certain descriptor variables are more effective in predicting behaviour than others. The decision-oriented view is the normative segmentation view and takes certain propositions as given. The three propositions upon which normative segmentation is primarily based are the following:

The central proposition is that not all customers are created equal. This means that customers have to be different in order for segmentation to be profitable (which they usually are). Customers can differ along many attributes such as demographic variables. The challenge lies in identifying these differences and by measuring them.

A second proposition is that these differences are related to differences in market demand.

The third proposition is that distinct segments of customers can be isolated within the overall market. This refers to the bases according to which the customers are grouped into segments. Although there is much dispute about the usage of different bases, it is generally believed that the base(s) used should be one(s) that reflect and identify real underlying differences as to why the customers buy.

The three propositions can be summarized into two basic theoretical questions:

1) How the segments should be defined (according to what segmentation base)
2) How resources should be allocated among these segments

Price theory is concerned with setting prices and as it is concerned with the allocation of resources to segments a priori. It is, therefore, usually no longer considered the base for market segmentation, although it is an important element of the targeting and positioning stages of the segmentation process, discussed earlier. The two theoretical questions presented above, will now shortly be explained.

Kotler stated the first problem as "How can the seller determine which buyers' characteristics produce the best partioning of a particular market? The seller does not want to treat all the customers alike, nor does he want to treat them all differently" (Kotler 1967).

The literature so far has mostly focused on this problem, namely the choice of variables and descriptor variables, on the basis on which a market is to be segmented. The different bases will be discussed with the literature. The question of which bases to use inevitably brings us to the question of what the segmentation process should be like and how detailed the market should be segmented. This issue is addressed when the different approaches to segmentation are presented.

Which approach to use and how detailed a market is to be segmented naturally concerns the resource allocation issue. On one hand, the question is how the market is to be targeted and on the other hand it is a question of the cost of the segmentation process itself. This issue has been addressed by Bonoma and Shapiro (1983) and will be discussed when their approach to segmentation is introduced.

3. Segmentation and Industrial Marketing Strategy

The concept of market segmentation was born during the managerial years of marketing and it was first conceptualised by Wendel Smith in 1956. The managerial years of marketing were mostly characterized by defining control functions for the marketing mix elements and the emphasis was on the advantage of the producers. Market segmentation as strategy was, therefore, in the early years recognized mostly as a more traditional marketing function. It wasn't seen to affect the whole corporation. The producers produced the same products and variations of these regardless of how a market was segmented. The segmentation affected mostly promotional issues such as advertising. Thus, segmentation was seen more as a tactical device than a strategic tool. Although Smith emphasized the strategic importance of segmentation, it hasn't been till much later that the real strategic implications on a corporate wide basis have been recognized. The practical cases in which it is utilized to full long-term benefit are still fewer.

After the initial conceptualisation of market segmentation the subject arose enough interest to produce some theoretical contributions to support the concept (Claycamp and Massy 1968; Frank et al. 1972).

Segmentation has been successfully employed in consumer markets since the 1960's, where it has been used mostly as a sales and profit maximization tool. Interest in industrial market segmentation has arisen after the development of organizational buying behaviour theory. This delay in the production of industrial market segmentation literature is mostly due to the imperfect competition and underdevelopment of market forces within the business-to business-marketing arena.

The development of industrial markets and the increasing competition in these markets has strongly contributed to the birth of segmentation in the area of industrial markets. From being used as tactical device or merely in order to profit from price discrimination segmentation has become to be viewed as a strategic tool by academics and lately there has been an increase in the amount of published literature in the area.

Market segmentation in practice is not a simple concept, which can be seen from the array of attempts at constructing managerially oriented models for pursuing segmentation in practice. The basis for the strategy is rather simple, but not easy. In an increasingly competitive global market a company cannot be everything to every customer. Therefore, a company has to divide its market into segments based on various variables (*segmenting*). It then has to choose which segments it wants to compete in and to focus on these customers in the chosen segments (*targeting*). It then has to decide how it wants to *position* itself on the market against its competitors in terms of products, services, image, values, quality etc.

Today and increasingly in the future successful segmentation of industrial markets will become one of the cornerstones of survivor and success. A corporation has to choose what it wants to be to whom and to focus on a limited array of the market.

Segmentation should thus be a part of a corporation's overall strategy. Corporate strategy directs the direction of the corporation. On the business unit level the segmentation process then determines how the business unit will compete in its markets. The concept of segmentation as the strategy at the business unit level in an industrial company is confusing due to its complexity.

4. Literature Review: Industrial Market Segmentation

Some of the most cited publication on industrial market segmentation are summarized in table 1 and table 2. This is to make the composition of the literature clearer, as they will then be discussed in the text.

Table 1: Key Conceptual Articles on Industrial Market Segmentation

Author(s)	Theme
Smith (1956)	Product differentiation vs. segmentation
Haley (1968)	Benefit Segmentation
Wind and Cardozo (1974)	Industrial Market Segmentation - A Two -Stage Model
Wind (1978)	Issues and Advances in Segmentation Research
Johnson and Flodhammar (1980)	Identification of variables in Industrial Segmentation - TEMCO
Garda (1981)	Strategic Market Segmentation (SMS)
Barnes and McTavish (1983)	IM Segmentation by Buyer Sophistication Buyer Sophistication Matrix
Bonoma and Shapiro (1983/4)	Industrial Market Segmentation - The Nested Approach
Bonoma and Shapiro (1984)	Evaluation of Segmentation Approaches (identifiability/accessibility vs. needs/benefits)
Cheron and Kleinschmidt (1985)	Industrial Market Segmentation A review
Hlavacek and Reddy (1986)	Identification and Qualification of Industrial Market Segments
Brown, Shivashankar and Brucker (1989)	Requirements Driven Segmentation
Knox (1998)	Loyalty-Based Segmentation The Diamond of Loyalty
Wedel and Kamakura (1998)	Concepts and Methods (Statistical)
Mitchell and Wilson (1998)	"Balancing" Theory and Practice

Table 2: Key Empirical Studies on Industrial Market Segmentation

Author(s)	Segmentation base(s) used	Method	Sample (N)
Cardozo (1974)	Situational dimensions - (familiarity, product type, importance and type of uncertainty)	Interviews	US
Lehman and O´Shaugnessy (1974)	Difference in Attribute Importance (benefits*)	Survey	19+26 (US and UK)
Choffray and Lilien (1978/80)	Purchasing process (buyer characteristics and involvement)	Survey	100 (US)
Speckman (1981)	Type of Organization	Survey	92 (RR=38%) (US)
Johne (1984)	Product Innovation Practices (The "way" in which companies innovate)	Interviews	16 companies * 4 people (UK)
Vollering (1984)	Interaction process (b-s)	Interviews	134 (NL)
Doyle and Sauders (1985)	"Benefits" (purchasing criteria)		(US)
Kluyver and Whitlark (1986)	Benefits	Secondary + Interviews	(US)
Moriarty and Reibstein (1986)	Benefits	Survey	489 (US)
Flodhammar (1987)	Customer and market dimensions	Sales Force interviews	
Day, Fox and Huszagh (1988)	Stage of Economic Development (of a country)	Based on secondary data	
Sharma and Lambert (1990)	Customer Service (needs)	Survey	246 (RR=31%)
Robertson and Barich (1992)	Stage of Purchase Decision Process	Case	1 (US)
Abratt (1993)	The use of Segmentation (and different segmentation bases) by industrial companies in the Rep. of South Africa)	Survey	32 (RR=37%) (Rep. of South Africa)
Griffith and Pol (1994)	Demographics	Secondary	(US)
Rao and Wang (1995)	Traditional segmentation bases as identifiers for benefit segments	Survey	172 (RR=34.4%) (India)
Verhallen et. Al. (1998)	Strategy (the type of "strategic orientation" the customer is pursuing	Survey	205 (RR=32%) (NL)

Some credit should at this point be given to the early writers who laid the groundwork for later research in market segmentation. Chamberlin (1933) Robinson (1938), working independently of each other, both published fruitful articles on the economic theory of imperfect competition, realizing that there exists heterogeneity in the demand of goods and services. Smith further developed their ideas in his article of 1956, emphasizing the heterogeneous composition of any one market. Interestingly, Frederick realized as early as 1934 the concept of segmentation bases. He described the five factors: industry, product use, company buying habits, channels of distribution and geographic location as the factors to be taken into account when defining a market (component market). This is probably the earliest work to be found in the area of segmentation bases.

Since Smith’s classic article in 1956 much has been written on the subject and many have tried to define the core of segmentation. Smith’s definition, however, remains adequate even today, some 40 year later. He recognized that segments should be based on consumer/user wants and a company should be better able to serve these needs when it has defined some segments within a larger market. Although he described differentiation and segmentation as partly alternative strategies, he realized that "they are closely related concepts" (Smith 1956, p. 8). He also pinpointed something that many authors since have forgotten: the basic assumption should be that the differing wants and needs of the customers should be the base for segmentation. Today we would include in the definition of a product the attributes related to that product - the augmented product.

The literature on industrial market segmentation is not yet overwhelmingly volumnious.
In 1984 Bonoma and Shapiro noted that in their search they could find very few articles that had "any direct impact upon the development of industrial market segmentation". They further noted that: "very little academic work has been done on industrial market segmentation" (p.4). Since 1984, the interest in market segmentation in academic circles has increased. This can be seen in the growing number of publications in the area in recent years. The number of reported practical applications, however, remains low. Among others, Hlavacek and Reddy (1986) have expressed

their concern for how little effort many industrial companies put into identifying segments and implementing segmentation.

Most of the research so far has concentrated on determining the most appropriate base (variable) or bases for segmentation. The reason for this is, that the selection of the segmentation variable(s) is extremely critical, as it will determine the final outcome of the segmentation process. The underlying assumption for all segmentation is that there exist some variables on the basis of which, customers can be grouped to form different segments. These segments have to respond differently to one or more critical marketing mix elements. Therefore, the key question in determining the segmentation base is, whether or not, the particular base will result in segments, which seek different benefits. There are several evaluation criteria for effective segmentation as mentioned earlier. This assumption, however, should function as the prime evaluation criteria in determining the segmentation bases.

The bases generally used for industrial market segmentation have been categorized in numerous ways by different authors. The literature will now be reviewed in two parts. The *first* part will discuss one segmentation base (group of segmentation bases) at a time and look at the authors who have used the bases in empirical papers and what has been stated about the use of the particular base in some of the conceptual articles. The bases will be viewed in two groups: *observable* segmentation variables and *unobservable* segmentation variables. The *second* part will discuss the literature in terms of some general approaches that have been proposed in the literature and some of the recommendations that have been made regarding which segmentation bases to use in combination with each other.

4.1 Observable Segmentation Variables

The observable variables include variables that are easily observable and obtainable. Most of them can be obtained from secondary sources. They can generally be assumed to be more objective and measurable that the unobservable variables. They are also much less costly for a company to obtain and use for segmentation purposes. These are some of the prime reasons for why these variables have been widely used as bases for segmentation by practitioners.

4.1.1 Geographic Segmentation

Geography in a segmentation context primarily refers to location. Companies can segment their customer base according to cities, countries, regions or the continents where they operate. Many authors state that most early segmentation was strongly based on geographic data (Haley, 1968; Moriarty and Reibstein 1986; Verhallen et al, 1998), although it seems impossible to find an academic study based only on geographic variables. Many researchers have included geographic variables in their models, though.

An example is Bonoma and Shapiro´s nested approach (1983) (they include geographic variables in the section of "demographic" variables). They emphasize that geographic location is important in staff deployment.

Researchers are generally of the opinion that segments based on geographic variables do not result in segments that differ in their response to the marketing mix (benefits) (Moriarty and Reibstein 1986; Mitchell and Wilson 1998), although Jobber (1995) notes that location may influence the *purchasing practice* and *product requirements*, due to differences in socioeconomic and cultural factors. Mitchell and Wilson (1998) point out that the use of geographic variables may be justified in situations in which the *industry itself is dependent on a specific geographic area* (e.g. some natural resource based industries). A key problem, which Griffith and Pol (1994) discuss in their paper, is that the concept of "location" is a difficult one in that it can imply the location of the plant, the sales office, the purchasing department etc. As companies become more global, they also spread their operations globally and geographic variables become even more difficult to use. Another problem is to assess the size of these different geographic units (Griffith and Pol, 1994). Although geographic segmentation does not result in segments with differing needs, and thus cannot be considered as an effective segmentation variable on its own, it becomes an important variable to use in the targeting phase of the segmentation process. It can be used to assess the attractiveness of certain customers, because location often affects the cost of serving a customer and thus the profitability of the account. (E.g. in businesses where proximity is required (low value-per-unit/weight/volume) or where service/maintenance support is required).

Despite the obvious ineffectiveness of using geographic variables as the base for segmentation, studies have shown that geographic variables are the most commonly used variables for segmentation (together with demographic variables) (Wind and Cardozo, 1974; Abratt 1993).

4.1.2 Demographic Segmentation (Emporographics)[1]

Demographic segmentation refers to segmentation, which is based on demographic variables such as industry, size (number of employees, turnover etc.) and end-use of product. Some authors include geographic variables as demographic variables (Wind and Cardozo 1974; Bonoma and Shapiro, 1983; Beane and Ennis, 1986). Demographic variables are also widely used by practitioners (Wind and Cardozo 1974; Abratt, 1993). The reason for this is that demographic variables are widely available, inexpensive and segments based on demographics are easy to form (Moriarty and Reibstein, 1986; Bonoma and Shapiro, 1983; Griffith and Pol, 1994).

Yankelovich (1964) was probably the first to criticize the use of demographic variables. Haley (1968) argued that market segments based on demographics rely on descriptive factors rather than causal factors and that they are thus "less than optimum bases for segmentation strategies" (Haley, 1968, p.30). Several others have also criticized the use of demographic variables (Griffith and Pol, 1994; Moriarty and Reibstein, 1986; Verhallen et al., 1998; Mitchell and Wilson, 1998).

Griffith and Pol (1994) note that there are difficulties associated with the definitions of the variables. In other words, it may be difficult to define what is meant by size and to decide which measure of size to use. Size can be measured by the number of employees, turnover, size of the company, size of division, number of individual branches etc.

Moriarty and Reibstein (1986) published a study, in which they argue that the basic assumption of market segmentation (discussed at the beginning of p.) does not hold if demographic

[1] The term emporographics is sometimes used as the equivalent of demographics in the context of industrial markets

variables (only) are used. Their aim was to test whether or not traditional segmentation bases (demographic) yield segments, which respond similarly to the marketing mix. Their conclusion is that this presumption does not hold and that traditional segmentation bases do not thus act as surrogate measures for benefits sought.

Griffith and Pol (1994) published a study in which they used demographic variables to segment the market for a specific type of equipment sold to large retail chains and individual stores in the United States. Although they state that demographic variables can provide a clearer view of the market, they conclude that "segmenting industrial markets on the basis of demographics is only a first step toward more useful segmentation based on benefits" (Griffith and Pol, 1994, p. 45)

Despite the rather strong criticism that the use of demographic variables have had to face lately, the use of them as a first step toward a more integrated method can be justified. Bonoma and Shapiro (1984) argue that although demographic variables do not directly reflect the underlying needs of customers, the advantages lie in the ease of implementation and the low-cost. They emphasize that a company should consider the cost-benefits structure when choosing the segmentation base.

Cornish and Denny (1989) offer a comprehensive discussion on the use of demographic variables, in which they clarify the roles that demographics can play and how their use should be applied in different situations.

4.1.3 Other Observable Company-Specific Characteristics

As other buyer organizational characteristics can be seen variables such as the size of the customer account, the length of the relationship (b-s), the potential growth of the account vs. the estimated future costs of serving the customer etc. These were not included in the demographic section because the information is usually confidential and not available to the public. Also, some of these variables can be seen to be "unobservable" as they need to be estimated internally by the supplier company. These variables can be used for the assessment of the future potential and profitability of the customer/segment and are, therefore, of strategic importance (Dickson, 1992). Their use as a prime segmentation base, however, is questionable as they do not all directly assign customers to segments with similar benefit/need requirements.

4.2 Unobservable Segmentation Variables

The unobservable variables cannot be obtained as easily as the observable ones. They are, in most cases, much more expensive to use and often also lead to a more costly segmentation strategy to implement. They are more difficult to measure and are, thus more subjective in nature.

4.2.1 Buyer Organizational Characteristics and Buyer Behavior

Organizations are complex and can be viewed from many different perspectives. Much segmentation research has concentrated on some aspect of the buyer organization, other than the observable characteristics mentioned in the previous section.

The segmentation research based on buyer organizational characteristics and buying behavior originates from the industrial buying behavior literature. Although it was mentioned in the scope of this paper that organizational buyer behavior was not to be dug into very deeply, some of the early work needs recognition because it has strongly influenced segmentation research.

This section will review the different bases that have been used for segmentation which are all based on some aspect of organizational behavior. The research in the field is fragmented between the different possible bases and many of them overlap.

Yankelovich (1968) made an early contribution to the behavioral approach to segmentation. He proposed that segmentation should shift from using "traditional" bases to using the decision-making process and the participants in the decision-making unit as the focus in segmentation.

In their early work Robinson, Faris and Wind (1967) proposed that industrial markets should be segmented according to the *type of buying situation* (straight re-buy, modified re-buy and new buy) and the *stage in the decision process*. These ideas can be seen to have strongly influenced later publications.

Cardozo (1974) identified, based on numerous interviews over an extensive period of time, that segments could be formed by grouping industrial buyers based on four dimensions: the buyers' familiarity with the *buying task* (new or re-buy*), the type of product purchased*, *the importance of the buying situation to the buying organization and the principal type of uncertainty in the purchase situation*. He notes that combinations of these four dimensions can also be used as a base for segmentation.

Interestingly, Robertson and Barich (1992) published a practical case in which they, based on their extensive experience, segmented a case company's customers according to the "stage of the purchasing process". It can be compared to the first dimension of Cardozo's model "– buyers' familiarity with the buying task". As can be seen more or less the same bases have been used in 1967 and in 1992. Robertson and Barich's conclusion have some

Using the type of purchase and purchasing structure as bases, has been criticized by Mitchell and Wilson (1998) to say very little about real customer needs and to be strongly influenced by personal idiosyncrasies.

The early ideas of Yankelovich have been developed and used in empirical studies by Choffray and Lilien. In their articles of 1978 and 1980, Choffray and Lilien segment the market for a new type of industrial air-conditioning system. The segmentation was carried out based on the *structure of the purchasing decision process* (the phases in the process, the people involved and their roles in the different phases of the process).

Choffray and Lilien (1978) also proposed an operational model to assess industrial response to marketing strategy, thus concluding that the knowledge about the composition of the decision-making unit in a specific situation can help marketers to modify communication programs, so that these can be targeted at the segments, which are of the greatest strategic importance.

Mitchell and Wilson (1998) note that it remains unclear how the decision-making process itself relates to buyer needs.

Cardozo and Wind introduced their *two-stage model* to segmentation in 1974 (see section x.x), after introducing the concept of the buying center in 1972. In the two-stage model they divided the buyer organization into macro and micro variables. The macro variables included the characteristics of the buying organization and the buying situation, whereas the micro variables consisted of the characteristics of the decision-making unit (DMU).

Spekman (1981) published an a-priori study in which he used the *type of organization* as the dependent variable. He investigated how the type of organization then affected the importance associated with 30 environmental factors that the purchasing personnel consider at some time of the buying process. He concluded than the type of organization dictates the benefits sought, thus some people may argue that this study should be categorized as a "benefit" segmentation study. However, he used an organizational variable as the dependent variable and thus supports the belief that organizational characteristics could function as a basis for segmentation and result in benefit segments. (see benefits/needs based segmentation)

Building on the work by the early writers on buying behavior, Barnes and McTavish (1983) provided a proposal to segmentation on the basis of *buyer sophistication*. They included a case example but they didn’t operationalize their model.

Another example to segment industrial markets based on factors related to buyer behavior and organizational research, is the recent attempt by Verhallen et al. (1998) to segment the Dutch corporate market for car mobile phones by the strategy pursued by the buying organizations. They divided the customers into five different groups, representing four types of strategic orientation: *customer* oriented strategy, *financially* oriented strategy, *internally* oriented strategy, *human relations* oriented strategy and *research and development* oriented strategy. They concluded that a firms´ strategic type and orientation can be seen (based on their findings) as potentially important variables in segmenting industrial markets.

4.2.2 Benefits/Needs based Segmentation

Although Haley (1968) introduced the concept of benefit segmentation back in 1968, it hasn't attracted much interest until recently. As markets become increasingly competitive, many authors have expressed the growing need for segmentation which is based on benefits (e.g. Mitchell and Wilson 1998) Moriarty and Reibstein (1986) explain that this need exists: "because the ultimate objective of segmentation is to produce segments that are homogeneous within and heterogeneous between with respect to benefits sought" Moriarty and Reibstein (1986, p. 465). Haley (1968) defined benefit segmentation as "an approach to market segmentation whereby it is possible to identify market segments by causal rather than descriptive factors--. The belief underlying this segmentation strategy is that the benefits people are seeking in consuming a given product are the basic reasons for the existence of true market segments" (Haley, 1968, p. 31)

Haley´s article is a conceptual one in which he lays the ground for further development in the area. He further defends his view in concluding that "The so-called average [buyer] existed only in the minds of some marketing people. When benefit segmentation is used, a number of relatively homogeneous segments are uncovered" (Haley, 1968, p. 35).

Although benefit segmentation has long been well adopted by researchers and practitioners in consumer segmentation, the publications on benefit segmentation in industrial segmentation are very few in number. Abratt´s study (1993) also shows that benefit-based segmentation is not on of the most often used bases for segmentation among practitioners.

An early study that can be seen as a benefit-segmentation study is that of Lehmann and O´Shaughessy (1974). The study, which is bi-national in nature, analyzes how buyers evaluate different product categories, based on seventeen attributes. The study can be seen as a benefit study because the attributes rated are primarily benefits more than just pure product attributes.

An application is offered by Doyle and Saunders (1985), who first build a framework and then, based on this framework, segmented the market for an industrial specialty product. Their segmentation and positioning model includes both customer and competitor characteristics as well as both, market and financial objectives for the medium term. They also considered the firm's technical and marketing capabilities. As their approach is quite comprehensive it can be seen to have some strategic value. Kluyver and Whitlark (1986) offer an alternative approach. They make a distinction in their segmentation model between benefits "identified" and benefits "deliverable". They are thus able to construct segment attractiveness-company position matrices, which are very useful in formulating targeting and positioning strategies.

Some twenty years after Haley (1968) first argued for segmentation based on benefits, Moriarty and Reibstein (1986) published an article, which can be seen as a landmark in the area of benefit segmentation. They studied whether or not traditional segmentation bases result in segments, which are homogeneous in regard to the *benefits they seek*. They conducted a survey study among 489 decision makers, segmenting then on the basis of benefits. The respondents rated 33 attributes on a 1-6 scale. Later, the attributes were reduced, by applying cluster analysis. The resulting segments were compared to segments that could be formed by using traditional segmentation bases (demographic). Their study shows that by segmenting buyers by using traditional bases, segments, which seek the same benefits are not formed. The study was conducted in the acquisition of non-intelligent data terminals.

Rao and Wang (1995) provided a further empirical test of the assumption that traditional segmentation approaches can produce market segments, which are *homogeneous within and heterogeneous between* with respect to benefits sought. They studied the relationship between traditional and benefit approaches. Responses were gathered from 172 industrial buyers in India. Although their results offer further support that traditional segmentation approaches do not result in benefit segments, some support for Spekman's proposition that the benefit segments are dependent on the type of organization. However, as the two approaches did not align very well with each other, Rao and Wang suggest that future researchers should be very careful about using traditional bases.

The above mentioned studies have used attributes, which can be grouped to belong to several "macro-attribute" categories, such as, customers service, product attributes, price etc. Sharma and Lambert (1990) focused only on one category: *customer service*. They applied the model in a sector of the high tech industry, with promising results.

Despite the fact that benefit segmentation has been rated as superior, compared to the use of other bases, there are some problems associated with it. As drawbacks can be mentioned that it is almost impossible to identify what segment a potential customer belongs to without having the customer to rate the benefits/needs. Thus, the predictability criterion is poorly met. Moriarty and Reibstein also point out that although segment members may have the same needs or seek the same benefits, that may be heterogeneous in regard to their media exposure, which may make communication with the members difficult (Moriarty and Reibstein, 1986).

4.3 Current Approaches to Segmentation as Described in the Literature

The actual methodological approaches used in industrial segmentation research is another area besides the choice of the segmentation base, which has attracted interest. This is an important area for researchers as it contributes to the theory formulation around market segmentation. It can be seen to be of at least the same level of importance to marketing practitioners, because it addresses the actual implementation of the segmentation process, which based on much of the current literature remains more than unclear. Researchers, therefore, tend to agree that this area should receive more careful attention.

The different approaches to segmentation have been traditionally divided according to the method used into *A-priori* and *Post-hoc* approaches (Green 1977; Wind, 1978). A-priori approaches refer to a situation in which the number and type of segments are determined in advance whereas in a Post-hoc approach the number and type of segments is determined by the data and results. An example of an A-priori segmentation base would be to use some demographic segmentation variable only. An example of a Post-hoc approach would for example be a clustering-based benefit segmentation study.

In the most recent publications the use of hybrid models, using both A-priori and Post-hoc approaches have been recommended (Bonoma and Shapiro, 1983; Sharma and Lambert, 1990, Rao and Wang, 1995).

Some of the simplest segmentation studies have used *one dependent variable* and some *independent variables* (a-priori approach). The clustering based approaches use a number of variables as *unordered*. A discussion that follows the previous discussion of segmentation bases in the case of using clustering approaches is a discussion of the number of bases that should be used for optimum results. As indicated earlier there is a need for careful selection of the variables. As Churchill (1991) put it, there is a need to avoid "shotgun" approaches, where everything known about the observations is used as basis for clustering. Therefore, the number of variables used should be limited to those most relevant for forming segments with similar needs/benefits requirements.

This question has been addressed in several conceptual articles. The different proposed combinations of bases will now shortly be reviewed.

Garda (1981) proposed the following variables in his framework for strategic market segmentation in industrial markets (SMS): end-use of product, the product itself, geographic variables, customer-size and common buying factor.

One of the more cited ones is the proposal of Johnson and Flodhammar (1980). They constructed a framework called TEMCO2: Technology, Economy, Market, Competition and Organizational variables. Organizational variables are comprised of two groups: the *customer's buying process* and the *customer's decision-making composition*.

In a later working paper Flodhammar (1987) used this framework to segment a sector of the manufacturing industry based on qualitative interviews of the salesmen. He, thus introduced the question of whether the sales force can provide the information needed to segment industrial markets.

As can be seen, these approaches use a combination of the segmentation bases discussed separately in the previous section.

The two approaches to segmentation, which have probably received the most attention in market segmentation, at least among researchers are those proposed by Wind and Cardozo (1974) and Bonoma and Shapiro (1983). These models offer guidelines for the implementation process of segmentation, as well as propose the bases to be included. Thus, they offer a theoretical contribution as well as managerial guidelines.

4.3.1 Macro-Micro Model (Wind and Cardozo 1974)

This two-stage model proposed by Wind and Cardozo suggests that the segmentation process should be carried out in *two successive stages*. The *first stage* involves the *formation of macro segments*, which are based on the characteristics of the buying organization and the buying situation (size, usage rate, application of product, SIC code[2], location, new vs. repeat purchase, organizational structure etc.). This stage thus incorporates both geographic, demographic as well as some organizational bases. The corporate objectives will direct the choice of the variables to be included. Macro-segments are then formed based on these macro variables. In the *second stage* the macro segments are then evaluated and if the segments do seem to respond distinctly to a specific market stimuli, then the segment is targeted as such. If they don't then the *derived* segments are further divided into segments based on micro variables based on key decision-making unit characteristics. The desired micro segments are then selected based on the costs and benefits associated with reaching the segment.

This hybrid approach to segmentation takes into account that it may not always be necessary to segment a market beyond demographic variables. If, however, the first stage does not result in desired segments, they can then be further segmented. There is one central problem that can be seen to be associated with using this model. This segmentation approach is purely vertical. In other words, once the customers have been segmented according to the criteria in the first stage, customers in different segments cannot be assigned to the same segment based on the variables

[2] SIC - Standard Industrial Classification Code

used in the second stage. This can result in too many segments and thus to a problem in the substantiability criterion.

4.3.2 The Nested Approach (Bonoma and Shapiro 1983)

The nested approach is built on the assumption that depending on the situation, different levels of segmentation may be needed. In some situations segmentation based on only demographic variables may be enough, whereas other situations may require segmentation based on several bases. The nested model has five different levels or nested phases as they call them. They recommend industrial markets to be segmented in a successive fashion beginning with the *general observable and objective level* and depending on the situational need to move towards the more *specific and subjective level.* They have named the five stages according to the variables included. The stages are: Demographics (industry, location, size), Operating Variables (technology, user-nonuser status, financial capabilities), Purchasing Approaches (organization of DMU, purchasing policies, purchasing criteria), Situational factors (urgency, application, size of order) and Personal Characteristics (motivation, b-s relationship, risk perception).

The model helps to clarify the different levels of the segmentation bases involved, but does not as such give any more direct advice as to how to carry out the segmentation based on the variables. They simply state that different forms of data and styles of analysis are appropriate at different phases of the descriptive model, but do not offer practical suggestions when it comes to the choice of methods.

In a slightly later paper, Bonoma and Shapiro (1984) concentrate more on the managerial issues of implementation and cost-benefit analysis. In this paper they classify segmentation approaches into two general approaches. The *"identifiable/accessible" approach* and the *"needs/benefits" approach*.

The identifiable/accessible approach disaggregates a market based on the identifiability of the customer and the accessibility of the seller. It assumes that these characteristics are associated with an underlying need. This approach is relatively easy to implement and inexpensive, although it is not necessarily based on benefits/needs.

The needs/benefit based approach can be seen as advantageous in the sense that it is actually driven by the needs/benefits. This approach aggregates customers, which share a common need/benefit to form segments. The dichotomy of *aggregation/disaggregation* can thus also be used to group different segmentation approaches.

5. Discussion and Implications for Further Research

The review shows that the literature and research on industrial market segmentation is increasing in number and the very diverse research can be found in the area. As segmentation is not a new phenomenon, there seems to be a relatively well accepted terminology in use, although some concept definitions differ slightly among authors. The research can be divided into two types

The articles in this review were classified as empirical or conceptual. This classification follows the nature of the studies. The studies can be generally divided into three different types. Some are mostly conceptual discussions and do not offer direct empirical support (Bonoma and Shapiro 1983; Wind and Cardozo 1974), some are mostly conceptual with some empirical support (e.g. Flodhammar 1980) and a great number of articles seem to concentrate mostly on the methodological techniques used in segmentation, with an interest in the industrial market.

Most empirical studies have been cross-sectional in nature. An interesting aspect for future research would be the developmental aspect of the segmentation strategy, as external forces and market change have been identified to be critical in today's world for a successful segmentation strategy. There is a clear lack of longitudinal research in the field of industrial market segmentation. Some longitudinal research can be found in the area of consumer goods market segmentation.

These focus areas within the current research indicate that there is a need for more research aiming to develop a normative framework of industrial market segmentation. More effort should also be placed at trying to bridge the theoretically desirable and managerially applicable segmentation methods. Except Mitchell and Wilson's (1998) try to synthesize these two in a conceptual article, very little attention has been paid to this aspect so far.

The review indicates that many of the segmentation bases used in industrial market segmentation are not directly related to customer needs, although the needs' aspect has been emphasized by some authors (e.g. Haley 1968, 1985). In consumer markets, consumer need is today considered to be the most important segmentation base. The fact that many of the authors in the articles reviewed, use other than needs-based segmentation bases, indicate that not all industrial markets are yet fully competitive, although there are industries, which are already highly competitive. This assumption is based on the theory of segmentation. Full segmentation is mainly required in highly competitive markets. It can be argued that as industrial markets become more competitive, researchers as well as practitioners should seriously consider this in the development of segmentation approaches. So far industrial segmentation has mainly been approached from the suppliers perspective. As most industrial markets have become increasingly networked, there is a need to integrate both parties' needs in the segmentation approaches.

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