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CUSTOMER VALUE IN ORGANIZATIONAL BUYING: A MEANS-END
APPROACH

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ABSTRACT

There has been a lot of interest among marketing practitioners and researchers in the concept of value perceptions of customers related to a product or service because the ability to create superior customer value is considered to be a prime source of sustainable competitive advantage for businesses (Porter, 1985). Despite the growing interest, there is a dearth in research on customer value as a construct and its role in organizational buying. The purpose of this research was to expand our understanding of what organizational customers value in a product or service and why they value what they do while making buying decisions.

The basic premise of the marketing concept is that a product (or a service) is a bundle of physical and perceived attributes, which provides a customer with a bundle of physical and perceived benefits to satisfy his/her needs and goals. This is also a central tenet of the means-end theory (Peter & Olson, 1993) which implies that what attributes a customer values (considers important) in a product is connected to those benefits derived from it that facilitate achieving his/her end goals as perceived by the customer. Because of its ability to provide a deeper understanding of the customer decision making process, this study used the interviewing and data analysis technique called laddering based on the means-end theory (Reynolds and Gutman, 1988). Total 60 customers of a piece of telecommunication equipment code named pronom were interviewed in 40 organizations from the names provided by a pronom manufacturer code named Skycorp. The interview data were coded in specific categories of attributes (A), benefits (B), and end goals (E) as explained by Reynolds and Gutman (1988) to create an implication matrix. Such a

matrix shows the number of links among A, B, and E, which Woodruff and Gardial (1996) called customers' value dimensions underlying prompt buying decisions. A framework of customer value in organizational buying was proposed based on the analysis and classification of the value dimensions, means-end theory, and marketing literature. In addition, A, B, E derived were further analyzed for different segments using proportions and cluster analysis.

This research is a step toward bringing out some of the sources and contents of customer value in organizational buying and toward developing a testable framework of value to help business marketing practitioners and researchers better understand the organizational buying process.

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Chapter 1

INTRODUCTION

1.1 The Research Problem

There has been a lot of interest among marketing practitioners and researchers in the concept of value perceptions of customers related to a product or service because the ability to create superior customer value is considered to be a prime source of sustainable competitive advantage for businesses (Porter, 1985). Despite the growing interest, there is a dearth in research on customer value as a construct and its role in organizational buying. Knowing what a customer considers valuable in a specific product and why is becoming increasingly important now as intense global competition and instant access to information on the Internet make it harder for marketers to differentiate their products from competitors. The purpose of this research is to expand our understanding of what organizational customers value in a product or service and why they value what they do while making buying decisions.

The basic premise of the marketing concept is that a product (or a service) is a bundle of physical and perceived attributes, which provides a customer with a bundle of physical and perceived benefits to satisfy his/her needs and goals. This is also a central tenet of means-end theory (Peter & Olson, 1993) which establishes that buying behavior is directed by a customer's end goals because end goals determine what benefits or consequences a customer seeks from a product and that in turn determines what attributes are salient to him/her. Therefore, what a customer values in a product is connected to those benefits derived from the product that facilitate achieving his/her end goals as perceived by the customer. Once we gain the knowledge of what

customers value in a product, we can apply that knowledge to find out what they are willing to pay for what they value or how much that specific product attribute or benefit worth to the customers.

For this research, customer value in organizational buying is conceptualized as a customer's perception of what is important or salient in making product-supplier choice decisions. The key proposition of this research is that in a buying process, a customer values (chooses) those attributes which in his/her perception provide maximum value (worth or utility) toward achieving end goals.

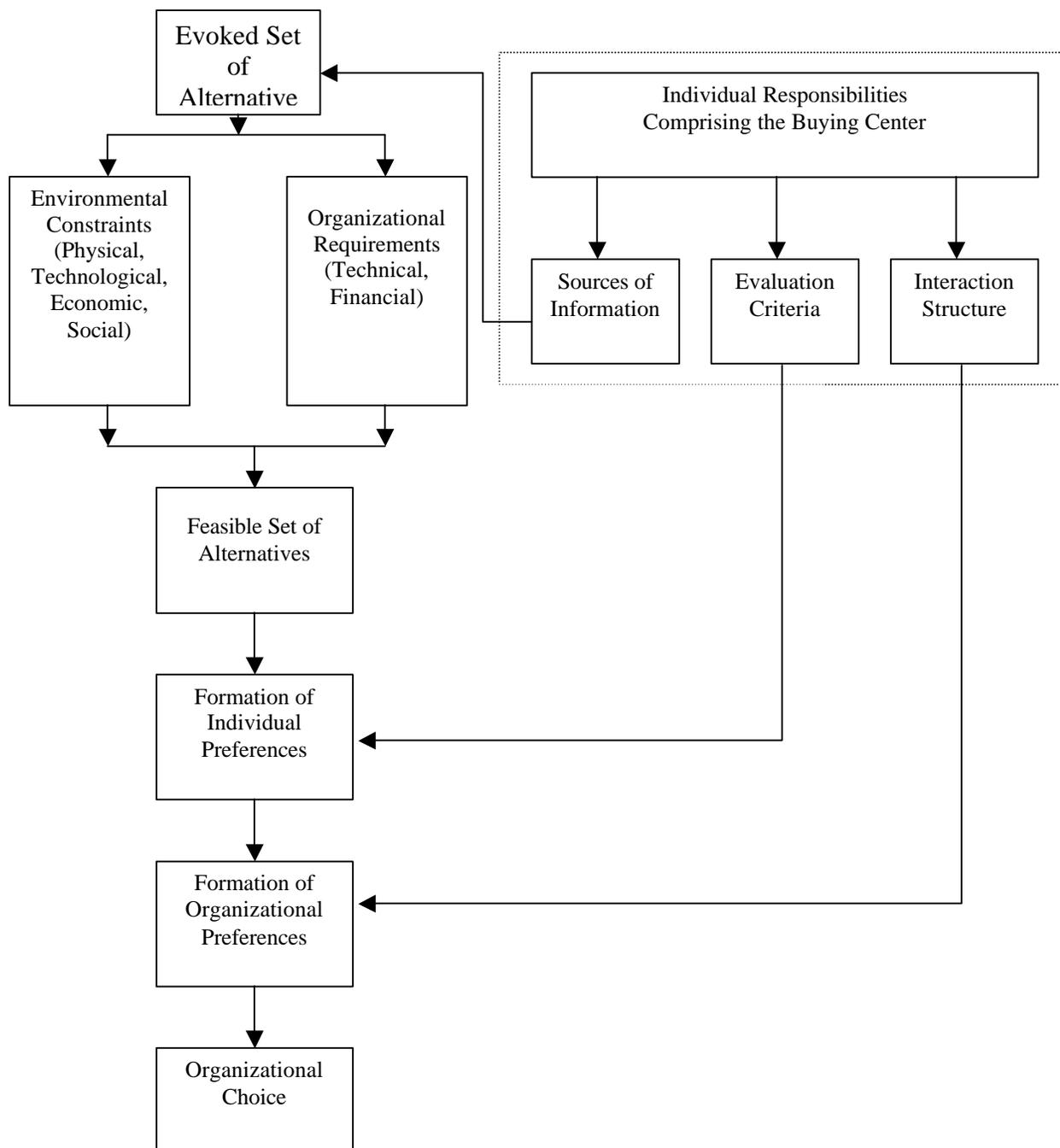
Value of a product to a customer has been defined in many ways by marketing scholars as detailed in the next chapter. The focus of the earlier research on value in business marketing was on calculating economic value and value-in-use of a product. Uradnisheck (1978) showed how customers get value-in-use (VIU) by changing from conventional cable to a fiber optic cable. Gross (1978) depicted the concept of relative perceived value of two product offerings in terms of the price premium for indifference. Forbis and Mehta (1981) proposed the concept of Economic Value to the Customer (EVC) which was similar to VIU in that it referred to the incremental value a customer attached to a substitute or new product compared to the incumbent. Reddy (1991) proposed the concept of perceived value as a sum of VIU and intangible value. The definition of value proposed by Anderson, Jain, and Chintagunta (1993) includes the concept of monetary worth of benefits customers receive for the price paid. While we have made some progress in developing practical aspects of value, we need to build conceptual and empirical models of customer value in business marketing. As Ulaga (2001) stated: "Research on customer value is of increasing importance in the marketing discipline. Yet, few researchers have investigated the construct and its operationalization in business-to-business setting" (p. 319). This research takes a step in that direction by conducting an exploratory study of organizational customers of a high tech product and using an inductive approach to develop a framework of value in organizational buying based

on means-end theory and laddering technique. It also shows specific applications of this research in field of segmentation and positioning. The key contributions of this thesis for research in business marketing are the proposed customer value framework and application of the laddering methodology; both will provide a deeper understanding of customer needs and choice process.

1.2 Background of Organizational Buying

The organizational buying process often involves a complex set of decision making and evaluative steps pertaining both a product (or a service) and its suppliers. Original organizational buying behavior models of Robinson, Farris, and Wind (1967); Webster and Wind (1972); and Sheth (1973) provide foundational knowledge. Figure 1 shows Choffray and Lilien (1978) model of organizational buying behavior that served as a starting and guiding point for this research. Organizational buying involves a complex set of decisions for screening possible alternatives to select a specific product from a specific supplier. In the buying process, the decision makers are influenced by these four factors: (1) environmental factors such as technology and labor force conditions; (2) organizational factors such as budget, infrastructure, and technical requirements; (3) group factors such as functional area of buying center member, and role of each buying center member; and (4) individual factors such as prior experience of the buying center member, and job or position of the member. The four specific steps listed in the Choffray-Lilien model in Figure 1 labeled “evaluation criteria”, “formation of individual preferences”, “formation of organizational preferences”, and “organizational choice” led us to two basic questions with which this inquiry started.

Figure 1.1: Major elements of organizational buying behavior (Choffray and Lilien, 1978, p.22).



The basic questions are: (1) how are evaluation criteria formed by buying center members? (2) how are individual preferences formed in buying center members? Evaluation criteria are specifications on which organizational customers compare alternative products, services, and suppliers (Hutt & Speh, 1992). Survey of existing literature on product evaluation and selection specifications indicated that it centers on attributes. For example, Sheth (1973) describes how different buying center members such as product user, engineer, and purchasing manager value attributes such as delivery, price, quality differently based on their education, information content and processing, and past purchase history. Lehmann and O'Shaughnessy (1974) examine how customers weigh attributes differently for different industrial products in the U.S. and England. Wilson, Lilien, and Wilson (1991) present attribute-level choice criteria used by various buying center members in a group setting. While it is true that organizational customers are presented with information on various attributes of many product-supplier choices, how do they process that information in order to arrive at which attributes are determinant for making a choice? Cognitive processes taking place within each customer break down the information into selective attention, perception, and retention and determine the way a customer responds to a marketer's offering (Hutt and Speh, 1992). In order to simplify the decision making process, purchasing personnel develop product-supplier evaluation criteria such as the ones given below, which were shared with this researcher by a purchasing manager during the pretest.

Quality	-	34 Points
On-Time Delivery	-	28 Points
Service	-	23 Points
Cost	-	15 Points

Such product rating charts are used more for routine buying or straight rebuy situations as classified by the buygrid framework of Robinson, Faris, and Wind (1967). In scenarios where the

purchase situation is more complex as described by Bunn's "taxonomy of buying decision approaches" (1993) such as high purchase importance, task uncertainty, and extensive choice set our understanding of what attributes buyers consider important for decision making and why they consider them important, is weak. The most widely used method for assessing attribute importance is attribute ranking and weighting as illustrated by Lehman and O'Shaughnessy (1974), where customers are given a set of attributes and asked to (a) rank them in order of importance, and (b) provide the importance weight for each attribute. Alpert (1971) recommended identifying determinant attributes for a product which he defined as "those attributes projected by the product's image which lead to the choice of that product may be called determinant since they determine preference and purchase" (p.184). We modify this definition of determinant attributes to include those attributes that customers consider salient when making buying decisions. We now need to extend our understanding to learn the cognitive processes that drive attribute importance and rating, and ultimately, product-supplier selection. This research uses the customer value concept to explain the link between attributes and their salience by asking the question "what is it that customers consider important about this product-supplier offering?" based on means-end theory which states that attributes are means to achieving certain end goals.

1.3 Customer Value and Buying Behavior

Ulaga (2001) summarized the customer value concepts applied to three perspectives in the field of business marketing, in his editorial piece for *Industrial Marketing Management's* special issue on customer value. They are: (i) the buyer's perspective where value is created through products and services, (ii) the seller's perspective in which value is created through customer equity, and (iii) the buyer-seller perspective where value is created through relationship and

networks (p. 317). This paper deals with the first perspective of customer value for business marketing researchers and practitioners to understand what aspects of a supplier's offering the organizational customers consider important and why. Wilson and Jantrania (1997) delved into the third perspective of relationship value from buyer-seller perspective.

Knowledge of customer value is central to many key business areas such as product pricing, positioning, market segmentation, and communication in the field of business marketing as found by Anderson, Jain, and Chintagunta (1993) in their state-of-the-practice study among 100 marketing professionals in industry and market research firms. The definition of value proposed by them broadened the scope of customer value formulations of prior years by Uradnisheck (1978), Gross (1978), and Forbis and Mehta (1981). Prior approaches of value-in-use and economic value were based on the value analysis book by Lawrence Miles (1961), which showed how customers can save money by using new or different products or components. Anderson, Jain, and Chintagunta (1993) in their article in *Journal of Business to Business Marketing* and later Anderson and Narus (1999) in their book titled 'Business Marketing Management: Understanding, Creating, and Delivering Value', proposed the following definition. "Value in business markets is the perceived worth in monetary units of the set of economic, technical, service and social benefits received by a customer firm in exchange for the price paid for a product offering, taking into consideration the available alternative suppliers' offerings and prices" (p. 5, 1993). In a simplified form, this perspective suggests that one can compute the difference between value (V_1) of a product 1 stated in a dollar amount, and price (P_1) of product 1 ($V_1 - P_1$); and compare that with $V_2 - P_2$ of product 2 from a competitor. The product with a higher difference would be a better choice. Anderson and Narus (1999) recommend that marketers get involved in their potential and present customers' value determination process. While they detail several existing techniques to

calculate value (Appendix A) based on an initial model of value, they confess that building this initial model is the hardest step for marketers. “Gaining a comprehensive understanding of the value of a market offering in a particular customer setting often appears monumentally difficult” (Anderson & Narus, 1999; p. 67). In order to gain such an understanding Sinha and DeSarbo (1998) recommend that “the focus should be on investigating the process of how the notion of value is formed in the minds of consumers” (p. 247). Therefore, rather than asking “what is customer value”, if we ask “what does a customer value”, we can understand what it is that the customer wants in a product and why, in making purchase decisions. This research proposes a method to develop an initial model of customer value, which then can be used for specific calculations and calibration using some of the techniques described in Appendix A.

The means-end approach used in this research to study customer value in organizational buying scenario was guided by Zeithaml’s (1988) work. She developed a conceptual model relating price, perceived quality and perceived value based on her exploratory study using means-end analysis with consumers of juices and fruit drinks. She defined value as “the consumer’s overall assessment of the utility of a product based on perceptions of what is received and what is given” (p. 14). Her means-end model, as detailed in the next chapter, dealt with the relationships among what she called concrete or lower-level intrinsic and extrinsic product attributes to abstract or higher-level attributes such perceived quality and perceived value. The focus of her exploratory research among consumers was the relationships among all the attributes rather than customer value or perceived value. This research seeks to focus on customer value using the means-end approach in field of organizational buying.

Woodruff (1997) used some of the means-end theory concepts (without overtly identifying them) to define customer value as: “a customer’s perceived preference for and evaluation of those

product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer's goals and purposes in use situations" (p. 142). Woodruff and Gardial (1996) and Woodruff (1997) associated customer value with customer satisfaction and described laddering as a useful way of gathering and analyzing customer input to develop what they called "value dimensions"-the attributes, consequences, and goals of customers-in specific use situations. Woodruff and Gardial (1996) repeated the hypothetical wine cooler illustration given by Reynolds and Gutman (1988). While they showed an arithmetical formula to calculate overall satisfaction score using the ranking and weights of value dimension (as mentioned later in Chapter 6), their work did not include how attributes, consequences, and goals constitute customer value.

This dissertation builds on this stream of research to empirically examine and analyze what organizational customers consider important in making buying decisions about a specific product in order to develop a framework of customer value in organizational buying. Using the laddering methodology described by Reynolds and Gutman (1988), detailed interviews of customers of a telecommunication system code named prontom were conducted. Based on the analysis of the coded data, determinant attributes and their links to benefits and to end goals are presented to infer customers' value perceptions based on their means-end product knowledge for evaluation and selection criteria. The objective is to gain deeper understanding of the process of value creation in organizational customers because the goal of a seller company is to create a bundle of benefits that provide value to the buying center and to the customer organization (Wilson, 1986).

1.4 Goals of the Study

(a) To empirically examine customers' value dimensions in an organizational buying situation.

- (b) To develop an integrative theory-based framework of customer value in organizational buying using the empirical analysis.
- (c) To study differences in customer value profiles for customers in different segments.

1.5 Thesis Outline

This thesis is organized as follows. Chapter 2 provides the background and connotations of value across various disciplines, a review of literature on value in marketing, and value concepts associated with means-end theory. Chapter 3 describes the methodology, the study, and the coding procedure in detail. Chapter 4 presents the analysis of the data. Chapter 5 gives the framework of customer value in organizational buying. Chapter 6 concludes the thesis with a summary, contributions and implications for research and practice, limitations and future research issues.

Chapter 2

BACKGROUND OF VALUE

As mentioned in Chapter 1, one of the key objectives of this research is to develop a framework of customer value and its role in organizational buying. There are many connotations of value in various fields as described in this chapter. As marketing heavily draws upon theories of different branches of social sciences, it is imperative for us to examine the concept of value and its interpretations across disciplines in order to develop an understanding of value in the context of business marketing. Therefore, section 2.1 provides a review and discussion of value literature in various fields of social science with Table 2.1 summarizing the different ways the value concept has been depicted. It depicts three perspectives of value emerging out of the literature. First is the perspective of human values as end goals. Second is the economics and purchasing perspective of value. Third is an accounting and finance perspective of asset value.

Section 2.2 presents a review and discussion of value research in the field of marketing- both consumer as well as business-to-business marketing with Table 2.3 summarizing the value concepts in marketing literature. While related to the perspective of value as end goals, section 2.3 describes value concepts related to means-end theory in more details.

2.1 Value: A Review Across Disciplines

2.1.1 Value as end goals and evaluation criteria

Rokeach (1973) provides the following definition of value: “a value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence” (p. 5). He conducted extensive

research on values and classified values into two categories: instrumental values which are the desirable modes of conduct such as being honest or courageous, and terminal values which are the desirable end-states of existence such as family security and happiness in life. A common definition offered for the whole field of social science depicts value as “generalized, abstract ideas held by human individuals or groups about what is desirable, proper, good or bad” (McLeish, 1993; p.769-770).

Table 2.1: Connotations of value across disciplines

Value Connotation	Reference	Definition
Values	Rokeach (1973)	“A value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence” (p. 5).
Values	McLeish (1993)	“Generalized, abstract ideas held by human individuals or groups about what is desirable, proper, good or bad” (p.769-770).
Use value or Value-in-use of an object	Smith (1776)	The properties of a product or service that accomplish or contribute towards accomplishing a task or work. It is the utility of a particular object. The value of an object is in its use and its capacity to satisfy a desire or to serve a purpose.
Use value	Miles (1961)	It is the lowest cost of providing for the reliable performance of a function.
Value (of a product)	Porter (1985)	“Value is what buyers are willing to pay, and superior value stems from offering lower prices than competitors for equivalent benefits or providing unique benefits that more than offset a higher price” (p. 3).
Value (of a product)	Miles (1961)	“The minimum dollars which must be expended in purchasing or manufacturing a product to create the appropriate use and esteem factors” (p. 3).
Cost value	Miles (1961)	It is the sum total of labor, material, and overhead costs required to produce a good.
Esteem value	Miles (1961)	It is the lowest cost of providing the appearance, attractiveness, and features, which the customer wants.

Exchange value	Smith (1776)	This is the power of purchasing other goods with the goods possessed by us.
Market value	Helfert (1966)	Market value is a fair approximation of the place of a good or service on the value scale of the business community or society in general.
Market value	Allison (1968)	In real estate, the market value is based on a comparison of a property in question with other similar properties that have been sold recently, plus current asking price and offers.
Assessed value	Helfert (1966)	Assessments of value are made of real property for purposes of taxation. The current market value may be a starting point from which the assessor proceeds to make adjustments according to governmental policy guidelines.
Appraised value	Helfert (1966)	Appraisals of value are made in order to determine a "fair value" of the good in question usually to establish a selling price where no ready-made market value of the tangible asset exists.
Liquidation value	Helfert (1966)	This value relates to the termination of an enterprise. Due to the urgency related to the selling of assets, their value upon liquidation will be a fraction of what they "were worth" to the going concern.
Replacement value	Helfert (1966)	This represents an attempt to determine, for a particular asset, the current market value of an asset that could take its place, in order to establish a fairer value for the old asset than its original cost less any accumulated depreciation.

As elaborated in section 2.3, means-end theory heavily draws upon Rokeach's work on values as end goals, and instrumental and terminal values. Rokeach (1973) argued that "value refers to the criteria, or standards in terms of which evaluations are made" (cf. Williams, 1968; p. 283). Rokeach's ideas of value as end goals and value as evaluation criteria are two fundamental concepts for this research. From the perspective of people having values, there are two approaches in marketing, named as macro and micro approaches by Reynolds (1985). The VALS program (Values and Life Style) developed by Stanford Research Institute (SRI) and LOV (List of Values) developed by University of Michigan Survey Research Center are major examples of the macro

approach. This approach involves classifying respondents into pre-defined categories based on their responses to a set of questions or statements regarding their personal values (see Kahle et al., 1986, for details). Marketers use the outcomes of survey results to segment markets and to position their products/services. The micro approach is used by the means-end theory as described in Section 2.3 later, and is more psychological. It focuses on customer motivations using an in-depth interviewing method called laddering (Reynolds & Gutman, 1988). According to the means-end theory, “means” are products or services and “ends” are values or end goals that underlie customer needs (Gutman & Reynolds, 1987).

2.1.2 Economics and purchasing perspective of value

As all economic systems are concerned with production and distribution of goods that are of value to individuals, groups or society as a whole (Helfert, 1966), the history of value research is long and diverse in economics. The main connotations of value used in economics, as elaborated below, are: the utility of an object, cost of production and labor, and the purchasing power of an object. While many early economists used the concept of utility, its interpretations were conflicting. For economists, Mill (1848) is considered to have resolved the paradox by declaring that the value of an object is in its use and in its capacity to satisfy a desire or to serve a purpose (cf. Fallon, 1964). However, the same resolve leads us to the question of the elements of product worth related to satisfaction of different desires or needs of the customer. Hence the terminology of use value, value in use, and economic value are still used to indicate sometimes distinct and sometimes the same aspect of value. In modern times, direct indices of preference or choice and substitutability have replaced value as a measure of utility in economics (Williams, 1968). From this perspective, value is “the relative position of a good in a preference ordering, and the higher its

position the greater is its value” (Kuhn, 1963; p.266). Simply put, it is the rank ordering of a buyer's choice of a product.

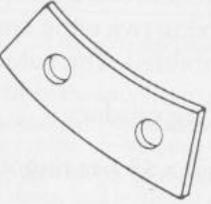
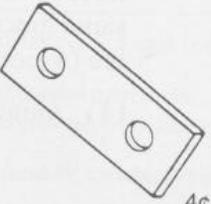
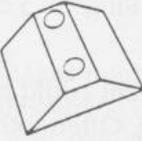
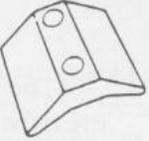
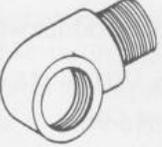
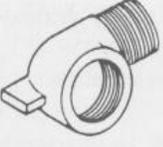
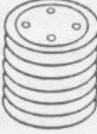
Value analysis is an important factor in the purchasing process and hence most books on purchasing management and production management talk about procuring products only after systematic analysis of their value from its functional utility and cost perspectives (e.g. Dobler et al., 1990; Lockyer et al., 1988). Lawrence Miles popularized the use of value analysis in U.S. industries in the 1940s and 50s. He summarized the ambiguity surrounding the term VALUE in that time period, which is still relevant today: “value means a great many things to great many people because the term VALUE is used in a variety of ways. It is often confused with cost and with price. In most cases, value to the producer means something different from value to the user. Furthermore, the same item may have differing value to the customer depending upon the time, place, and use (1961, p. 3)”. He viewed value as a measure of the appropriateness of the costs involved and defined value as “the minimum dollars which must be expended in purchasing or manufacturing a product to create the appropriate use and esteem factors” (p. 3). Miles further defined use value as “the lowest cost of providing for the reliable performance of a function” and esteem value as “the lowest cost of providing the appearance, attractiveness, and features, which the customer wants” (Miles, 1961, p.3-4).

The conventional way of assessing value of a product or component in purchasing management is value analysis. Value analysis is an organized sequence of investigation aimed at challenging existing product specifications, design, and production method (Fallon, 1971). Depending on the nature of the product, typical value analysis involves an inquiry such as the one given below as outlined by Hill et al. (1986):

- (1) What the material or part under consideration contributes to the end product?
- (2) What is the minimal function it must perform to give the end product the desired performance capabilities?
- (3) How much this minimal function or contribution is worth?
- (4) Does the part or material used need all its features?
- (5) What else would perform the same function?
- (6) Can it be made at lower cost?
- (7) Can it be obtained from another dependable supplier for less?

Table 2.2 depicts the example of cost cutting facilitated by value analysis as given by Lee and Dobler (1977). Most of the value analysis in purchasing involves steps to (a) reduce cost, and (b) improve performance by comparing available alternatives and developing new ones. Many businesses now get involved with purchasing and production departments of customer organizations to develop such value analysis or engineering programs as described by Anderson et al (1993). In the course of this research, it became apparent that unlike the consumers' views on value in Zeithaml's (1988) study (e.g., "value means low price" or "value is the lowest price for a quality brand", p. 13), organizational buyers such as purchasing managers did not have any direct views on value. Therefore, typical survey questions such as 'how do you compare the value of our product versus the alternative you considered', do not give us an understanding of organizational customers' value perceptions. Hence for business marketers it is imperative to unearth those perceptions using an indirect method such as laddering used in this study.

Table 2.2: An example of value analysis (Lee and Dobler, 1977, p. 256).

<p>Weights mounted on a rotor ring were curved to match the ring curve. Did it need this feature? No. Using a straight piece, the cost dropped from 40¢ to 4¢.</p>	 <p>40¢</p>	 <p>4¢</p>
<p>Field coil supports were machined from stock, but the original design blended nicely into a casting operation. The change resulted in lowering the cost from \$1.72 to 36¢ each.</p>	 <p>\$1.72</p>	 <p>36¢</p>
<p>This insulating washer was made from laminated phenolic resin and fiber. Machined from individual pieces of material, it cost \$1.23. A supplier with specialty equipment now fly-cuts the parts, nesting them on full sheets, at 24¢ each.</p>	 <p>\$1.23</p>	 <p>24¢</p>
<p>Standard nipple and elbow required special machining to fit a totally enclosed motor. Casting a special street "L" with a lug eliminated machining and a special assembly jig. The cost dropped from 63¢ to 38¢.</p>	 <p>63¢</p>	 <p>38¢</p>
<p>An insulator costing \$4.56 was originally porcelain, leaded extra heavy. Now molded from polyester and glass, it is lighter and virtually indestructible. New cost: \$3.25.</p>	 <p>\$4.56</p>	 <p>\$3.25</p>

2.1.3 Asset value perspective

The focus in the fields of accounting, finance, and real estate is on asset value as valuation of an asset is one of the key functions of these three areas. Organizational buyers may be involved in assessing added earning potential of capital equipment they are in the process of procuring; this and some of the other connotations of value such as resale value may be reflected in the buying decision process.

Buying center members from upper management and accounting department are involved when the product or service procurement decisions are to be made for capital equipment or for expensive materials. Many customers consult peers and at times professional consultants to assess the fairness of price based on market value, which is a fair approximation of the place of a good or service on the value scale of the business community or society in general. Market value of an object is dependent upon the nature of exchange mechanism and the conditions under which buyer and seller meet (Helfert, 1966).

For replacing an old piece of equipment, replacement value may be calculated. This represents an attempt to determine, for a particular asset, the current market value of an asset that could take its place, in order to establish a fairer value for the old asset than its original cost less any accumulated depreciation.

According to the concept of earning potential, value is measured by the total expected earnings (economic benefits) that will accrue to a long-lived asset over its useful life. Its elements are contained in the market value of an asset, because the demand for a good or service and the price a buyer is willing to pay will depend on the economic usefulness of the good or service. Its elements are also contained in appraised value, since the skilled appraiser will arrive at his/her judgment by taking into account the earning potential (Helfert, 1966). Expected earning power is

considered a key source of value for both tangibles and intangibles (Hendriksen, 1970). Some of the steps involved in calculating the value of most financial assets such as stocks and bonds lie in the streams of expected cash flows. Therefore, some assets are valued in similar ways in the following steps as described by Brigham and Gapenski (1990):

- (i) Estimate the cash flow stream, i.e. find both the expected cash flow for each period and the riskiness of each cash flow.
- (ii) Establish the required rate of return for each cash flow based on its riskiness and the returns available on their investments.
- (iii) Discount each cash flow by its required rate of return.
- (iv) Compute the present values to arrive at the value of the asset.

2.2. Marketing Perspective of Customer Value

Based on the fact that marketing heavily draws upon theories of different branches of social sciences, it is natural that we find some of the above mentioned connotations of value in marketing literature. As Philip Kotler says, the heart of marketing is exchange of “things-of-value”.

"The core concept of marketing is the transaction. A transaction is the exchange of values between two parties. The things-of-value need not be limited to goods, services, and money; they include other resources such as time, energy, and feelings."

(Kotler, 1972, p.48)

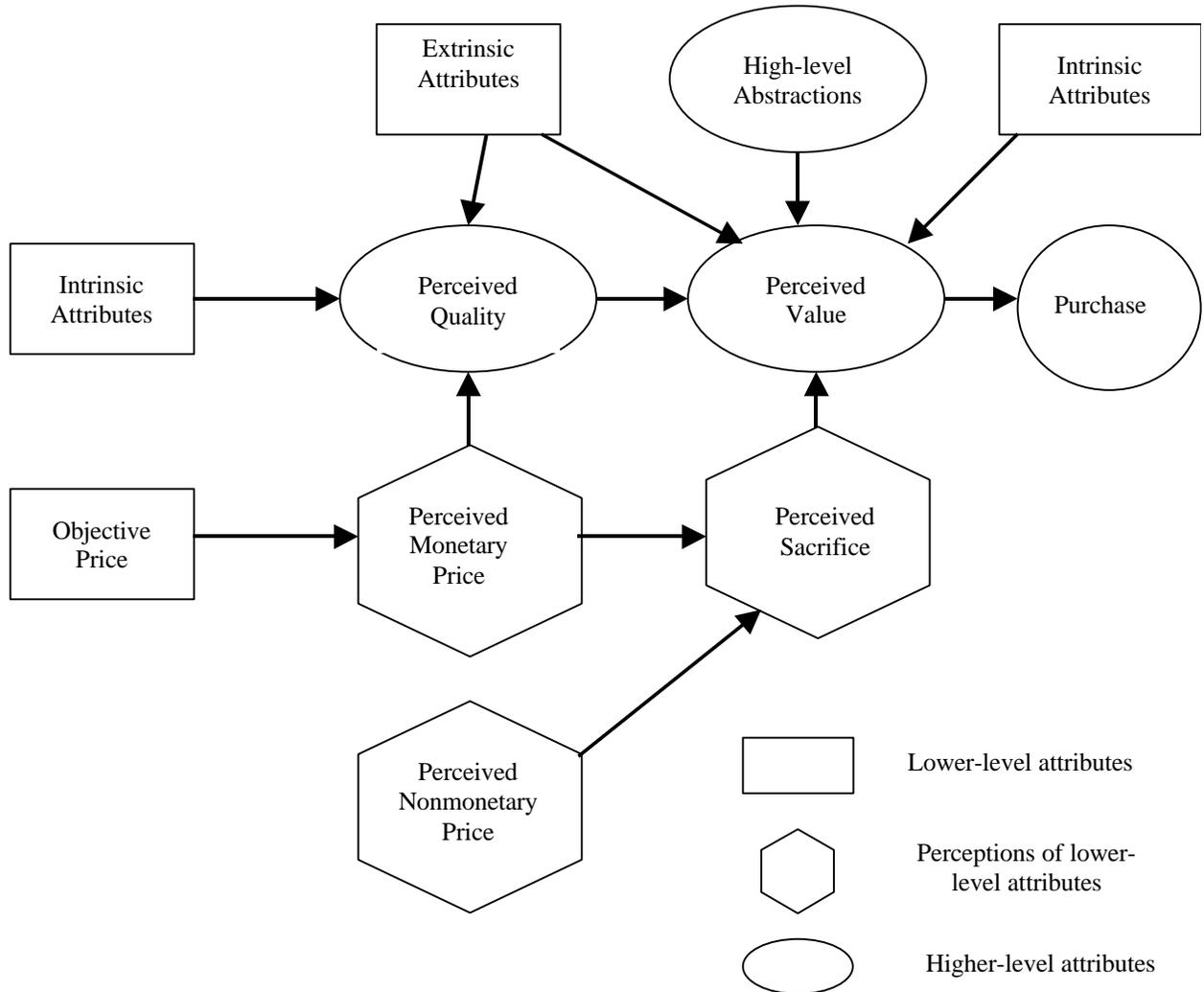
The connotation of objects having value reflects the basic philosophy of marketing, i.e., we as marketers have to offer things-of-value to customers. Table 2.3 provides a summary of some of the connotations and definitions of value depicted in marketing literature.

Table 2.3: Connotations of value in marketing literature

Connotation	Reference	Definitions
Economic Value to the Customer (EVC)	Forbis and Mehta (1981)	“The relative value a given product offers to a specific customer in a particular application-that is, the maximum amount a customer should be willing to pay, assuming that he is fully informed about the product and the offerings of competitors” (p.32).
Value	Holbrook & Corfman (1985)	"Value is an interactive relativistic preference experience-or, more formally, as a relativistic (comparative, personal, situational) preference characterizing a subject's experience of interacting with some object. The object may be any thing or event" (p. 40).
Value	Zeithaml (1988)	“Value is the consumer’s overall assessment of the utility of a product based on perceptions of what is received and what is given” (p. 14).
Value	Monroe (1990)	“Buyers’ perceptions of value represent a tradeoff between the quality they perceive in the product relative to the sacrifice they perceive by paying the price” (p. 46).
Value	(Anderson et al., 1993)	“Value in business markets is the perceived worth in monetary units of the set of economic, technical, service and social benefits received by a customer firm in exchange for the price paid for a product offering, taking into consideration the available alternative suppliers' offerings and prices”(p. 5).
Customer value	Gale (1994)	“Customer value is market perceived quality adjusted for the relative price of your product” (p. xiv)
Customer value	Woodruff (1997)	“Customer value is a customer’s perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer’s goals and purposes in use situations” (p. 142).
Perceived value	Reddy (1991)	“Perceived value is the value of the total offer or, in other words, the maximum price the customer is willing to pay for the bundle of economic and non-economic attributes associated with the product” (p. 15).
Value-in-use	Gross (1992)	“The hypothetical price for an offering at which the customer’s usage system would be at overall economic break-even relative to the customer’s best alternative.”

There are a number of studies that deal with the concept of perceived value and its relationship with price, brand name, and quality (e.g. Zeithaml, 1988; Dodds et al., 1991; Monroe & Chapman, 1987; Monroe & Krishnan, 1985). Zeithaml (1988) developed a conceptual model relating price, perceived quality and perceived value based on her exploratory study using means-end analysis with consumers of juices and fruit drinks. She observed that "what constitutes value-even in single product category-appears to be highly personal and idiosyncratic" (p.13). Zeithaml grouped consumer definitions of value in four categories: (1) value is low price, (2) value is whatever I want in a product, (3) value is the quality I get for the price I pay, and (4) value is what I get for what I give (1988, p.13). She defined value as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (p. 14). Figure 2.1 presents the conceptual model she developed based on earlier work of Dodds and Monroe (1985). Monroe (1990) contends that "buyers' perceptions of value represent a tradeoff between the quality they perceive in the product relative to the sacrifice they perceive by paying the price" (p. 46). As we can see, the concept of give (sacrifice) versus get (receive) is a common theme in this stream of research. In Zeithaml's study (1988), some consumers of juice considered money as the biggest sacrifice; for them, any decrease in price indicated increase in value so they spent a long time looking through circulars and coupons. For others, store- proximity, ready-to-serve food, and home delivery meant value, even if the price was higher. Zeithaml's model in Figure 2.1 shows that intrinsic attributes like taste and aroma, and extrinsic attributes like price and brand name affect perceived quality and value, which in turn influence purchase. The focus of her exploratory research among consumers was the relationships among all the attributes rather than customer value or perceived value. This research seeks to focus on customer value using the means-end approach in field of organizational buying.

Figure 2.1: A Means-End Model Relating Price, Quality, and Value (Zeithaml, 1988, p. 4).



Bolton and Drew (1991) used Zeithaml's study (1988) and customer satisfaction research to develop a multistage model of customer's assessment of quality and value of local and long distance telephone service. They presented (p.377) a conceptual equation of value as follows:

$$\text{VALUE} = v1(\text{QUALITY}, \text{SACRIFICE}, \text{CHAR})$$

Where

QUALITY = service quality

SACRIFICE = a vector describing monetary and nonmonetary costs associated with using a telephone service

CHAR = a vector of customer characteristics

Using the survey data from residential telephone subscribers, Bolton and Drew (1991) found customers' assessment of service value to be positively related to their evaluations of service quality, and that quality and value constructs were two distinct constructs.

In their chapter on quality and value, Holbrook and Corfman (1985) used axiological approach to define value as: "an interactive relativistic preference experience-or, more formally, as a relativistic (comparative, personal, situational) preference characterizing a subject's experience of interacting with some object. The object may be any thing or event" (p. 40). They explain this definition using four points: (i) value involves preference or positive disposition, (ii) value is neither wholly subjective nor objective, (iii) value is relativistic because it is comparative, personal, and situational, and (iv) value resides in experience or consumption of an object rather than its acquisition.

In business marketing, the work on value has only one connotation-that of a product's value or worth. Based on the literature in economics and purchasing, concepts such as value-in-use,

economic value, and use value have been used sporadically in the field of Industrial Marketing as it has been traditionally called.

Forbis and Mehta (1981) define the concept of Economic Value to the Customer (EVC) as “the relative value a given product offers to a specific customer in a particular application—that is, the maximum amount a customer should be willing to pay, assuming that he is fully informed about the product and the offerings of competitors” (p.32). They calculate EVC of product x compared to a reference product y as follows:

$$EVC_x = LC_y - SC_x - PPC_x + IV_x$$

Where LC is the life-cycle costs, SC is the start-up costs, PPC is the post-purchase costs, and IV is the incremental value product x offers compared to product y. Life cycle cost is calculated by adding a product’s purchase price, start-up costs, and post-purchase costs. They then define the incremental value as “the amount by which the product’s potential dollar value to the customer exceeds that available from the reference product. Incremental value may derive from physical features of the product or from other attributes of the total ‘package’ such as delivery, reliability, service responsiveness, and even brand name” (p.34). The authors give examples of how to calculate EVC in their paper and describe how EVC can be applied in strategy. While their approach has been practical and useful in specific product-market situations, it still leaves the concept of incremental value quite vague as they grapple with the issue of how different customers may value different features and how that can change the EVC. They briefly outline the situational variables that can influence the differences in incremental value, which I will be referring to in the next chapter.

Similar to EVC is another concept called value-in-use (VIU) as illustrated for a specific case of fiber optic cable versus wire cable by Uradnisheck (1978). He calculated VIU for fiber optic cable in dollars per meter as:

$$VIU = V_c + \Delta V_1 + \Delta F_1/m$$

Where:

V_c = the selling price of conventional cable (\$/m)

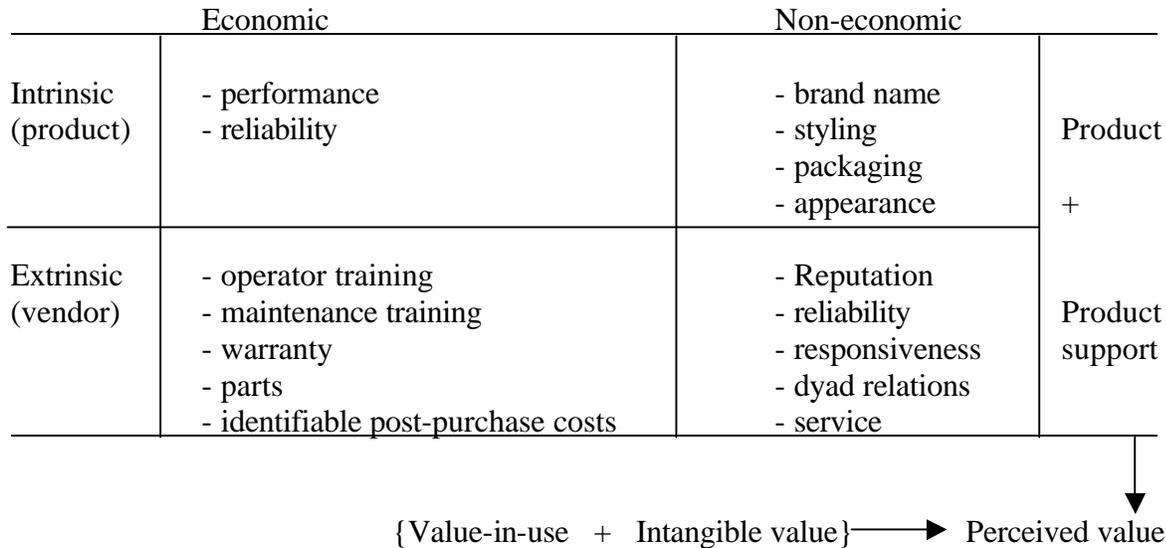
ΔV_1 = the difference in dollars between all the variable-investment cost of the conventional and fiber-optic cable

ΔF_1 = the difference in dollars between all the fixed investment costs of the two kinds of cable.

He then developed a list of costs involved for both the types of cables, considering the factors such as cable's weight, transportation cost, error rate, insurance cost, and maintenance cost, to calculate VIU for fiber optic cable. The author also recommends taking into account future cash flows resulting from the present investment in new technology.

Reddy (1991) distinguished value analysis or value engineering, use value, value-in-use (VIA), and perceived value, and presented all these in an integrated framework. He cautioned that although very useful in specific situations, such approaches as use value and VIA are "based strictly on quantifiable, economic criteria, with no provision for non-quantifiable factors affecting customer's perceived value" (p. 15). He proposed a 2*2 model of perceived value with economic versus non-economic value components on one axis and intrinsic (product) versus extrinsic (vendor) components on the second axis as shown in Figure 2.2. He recommended using choice modeling like conjoint analysis and competitive positioning analysis techniques such as multidimensional scaling (MDS) for assessing perceived value.

Figure 2.2 Components of perceived value (Reddy, 1991, p.16).



Sinha and DeSarbo (1998) propose a perceived value mapping method called VALUEMAP similar to MDS and compared the two methods using results of a survey among students rating 12 models of small cars on 8 attributes. They found that the VALUEMAP can identify reference brands and can better account for the latent dimensionality and heterogeneity thereby producing more meaningful results. However, they point out that in the study the attribute information was already given to the subjects and then asked to give their ratings and importance weight for each attribute for the cars. They recommend that we do more research to study how perceptions about value are formed.

In the field of organizational buying the focus on attributes akin to Sinha and DeSarbo (1998) has been quite prevalent. While most of this research does not use the word “value” in the context of a product’s worth to customers, multiattribute value analysis based on the attitude theory

of Fishbein (1975) as used widely in consumer behavior has been used in a number of papers in the organizational buying area as well. For example, Lehmann and O'Shaughnessy (1976) presented a model describing who in the buying center assigns more weight to a certain aspect of a product/supplier. Keeney and Lilien (1987) used multiattribute value analysis to assess the features and demand of a new product. Research on product evaluation and selection process includes a set of choice criteria used by the buyers (e.g., Wilson, Lilien & Wilson, 1991). But these models fall short of going beyond attribute or choice criteria level; short of explaining how buyers process the attribute-level information and make judgments about what is important and why. Organizational buying literature recommends that we should understand the choice process of buying center members to explain and predict their buying behavior (Ward & Webster, 1991). In understanding their choice process, the emphasis has been on attributes such as price, delivery, and quality. Although Webster and Wind (1973) have described the relevance of understanding buyers' cognitive processes in organizational buying decisions, there is little research in this area.

Value is an important concept in business marketing as indicated by a state-of-the practice study among marketing managers and marketing researchers conducted by Anderson, Jain, and Chintagunta (1993). They found that the knowledge of value is critical for essentially all the tasks of marketing. They proposed the following definition of value. "Value in business markets is the perceived worth in monetary units of the set of economic, technical, service and social benefits received by a customer firm in exchange for the price paid for a product offering, taking into consideration the available alternative suppliers' offerings and prices" (Anderson et al., 1993, p. 5). In the article, they present various value measuring techniques which have been given in Appendix A. The focus of their definition is on finding out what customers consider the worth of the benefits is to them. Inherent in this definition are the give versus get or sacrifice versus return connotations

of value as seen in earlier research. This research used their classification of benefits for developing the customer value framework as mentioned later. Anderson and Narus (1999) developed a textbook with a title “Business Market Management - Understanding, Creating, and Delivering Value” which presents business marketing from the customer value perspective, with several examples of how some companies are adopting customer value measurement. Their work has made important headway into the field of value assessment for managers.

Gale’s (1994) procedure to mathematically assess customer value which he defined as “the market-perceived quality adjusted for the relative price of your product” (p. xiv), has been used by several companies to monitor value. Woodruff in his 1997 article in the *Journal of the Academy of Marketing Science* argued that customer value is the next source of competitive advantage for business, critiqued the prevalent concepts of value, and proposed a customer-driven definition of customer value as follows. “Customer value is a customer’s perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer’s goals and purposes in use situations” (1997, p. 142). Woodruff and Gardial (1996) published a managerial book titled “Know your customer: New approaches to understanding customer value and satisfaction” in which they recommended means-end analysis and grand tour method to study customer value. They associated customer value with customer satisfaction. While they discussed laddering and repeated the hypothetical wine cooler illustration given by Reynolds and Gutman (1988), no empirical evidence or analysis was presented. Their work did not include how attributes, consequences, and goals constitute customer value.

The review of extant literature of customer value in organizational buying indicates the need to go beyond attributes such as price and quality to understand customers’ sense making

process that drives attribute importance and product-supplier evaluation. This research builds on the work of Zeithaml (1988), Anderson et al. (1993, 1999), and Woodruff and Gardial (1996) to identify the sources and contents of value for organizational buyers using means-end analysis.

2.3. Value in Means-End Analysis

Means-end analysis provides an appropriate approach to addressing the issue of exploring customer value perceptions associated with product attributes. Consumer researchers have extensively used means-end analysis to develop marketing strategies that link products to issues that the customer considers important (Reynolds & Gutman, 1988). Zeithaml (1988) used means-end analysis to develop a conceptual model relating price, perceived quality and perceived value based on her exploratory study with consumers of juices and fruit drinks. Walker and Olson (1991) studied the association between product and consumer involvement. Mulvey et al. (1994) explored this relationship further by examining content and structure of means-end knowledge for different categories of involvement. Pieters, Baumgartner, and Allen (1995) applied the means-end chain approach to consumer goal structures. Botschen and Hemetsberger (1998) determined the degree of marketing program standardization using means-end structures. Botschen, Thelen, and Pieters (1999) used laddering to link benefits with specific attributes of sales personnel of specialty clothing shops for benefit segmentation. Woodruff, Gardial and other researchers associated with “Customer value and satisfaction research program” at the University Tennessee have recommended means end analysis to study customer value (Woodruff and Gardial, 1996; Woodruff, 1997) and used it to study consumers’ recall of product evaluation experiences (Gardial et al., 1994).

A means-end chain is a simple knowledge structure that links product attributes to the consequences produced by these attributes, and, in turn, links these consequences with the values or end goals to which they lead (Gutman, 1982; Olson & Reynolds, 1983). “Means” are products or services and “ends” are end goals that underlie customer needs (Gutman & Reynolds, 1987). Consequences represent any result accruing to the customer from his/her behavior. They can be desirable or undesirable, the former are known as benefits (Gutman, 1982). For this research, we have used the term benefits for consequences for simplification. Since values represent important and desirable end goals (Olson & Reynolds, 1983), we have used the term end goals in its place to avoid confusion with customer value. At the core of the means-end perspective is the contention that customers can have product knowledge, meanings, and beliefs at different levels of abstraction (cf. Peter & Olson, 1993). A means-end chain represents a cognitive structure of product knowledge based on perceived causal relationships between meanings at different levels of abstraction (Olson & Reynolds, 1983), and it is represented here with the modifications to adapt this research:



Hence, a means-end chain seeks to explain how a customer's selection of a product enables him/her to achieve desired end states (Gutman & Reynolds, 1987). Aggregated means-end chains are depicted in “hierarchical value map” (HVM) or “customer decision map” (CDM) or “value structure map” (VSM) (terms used by advocates of means-end theory; Olson, Reynolds and Gutman).

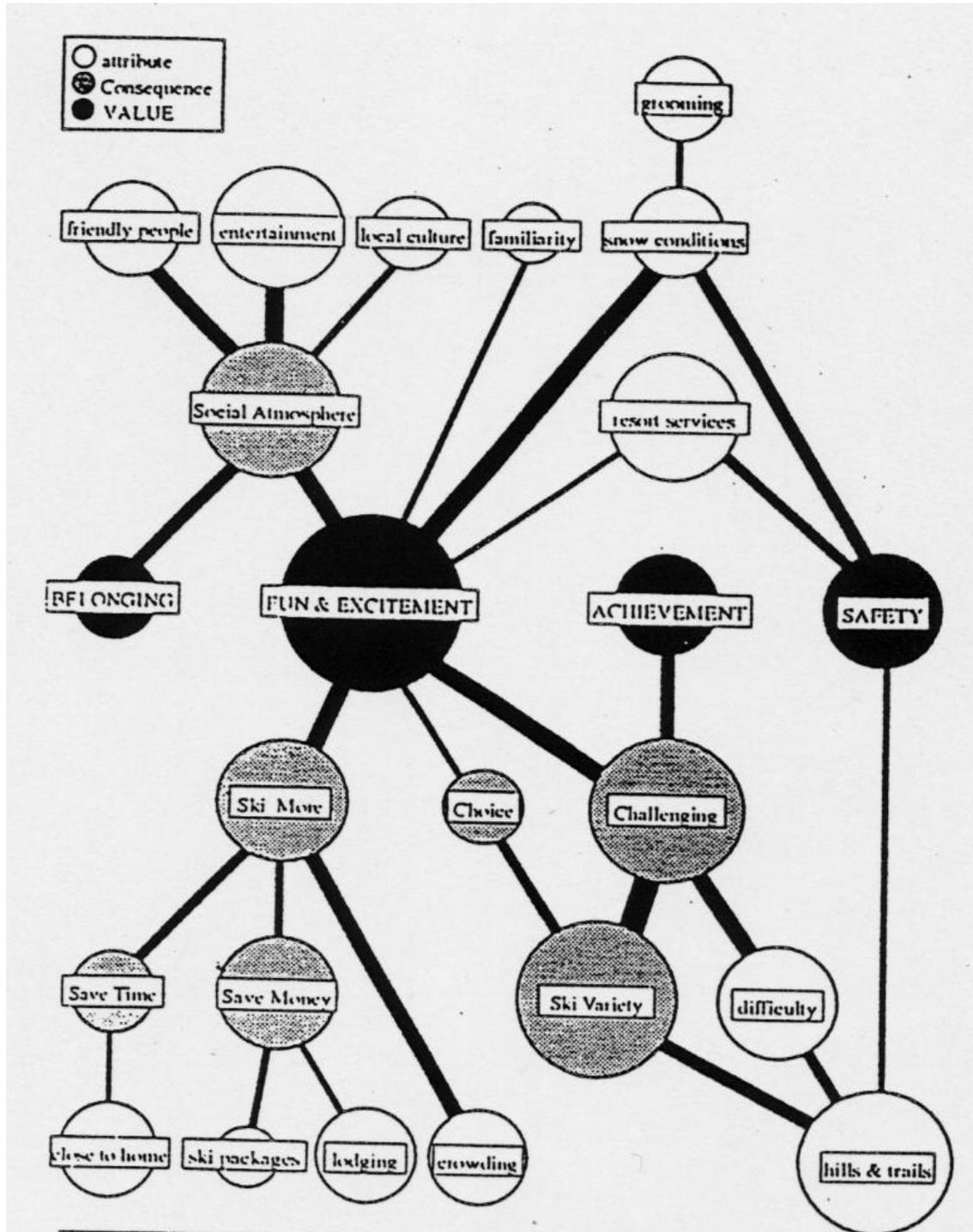
A number of studies in the area of leisure research have used means-end theory and method. Klenosky et al. (1993) studied people's ski destination choice, which we have used for an illustration below. Goldenberg et al. (2000) investigated benefits associated with a rope course by participants. Kashyap and Bojanic (2000) compared business and leisure travelers on their perception of price, quality, and value. A means-end chain may be illustrated using a map for a ski destination choice study done by Klenosky et al. (1993) as given in Figure 2.3. The study involved 90 visitors of a ski show who participated in laddering interviews. A respondent describes "close to home" as a key attribute that he considered while choosing a ski destination. He linked that to a benefit of "saves time" and then to another benefit "ski more". He then associated "ski more" to "fun and excitement in life", which is an end goal. This respondent's means-end chain is depicted as below:

Close to home → Saves time → Ski more → Fun and Excitement

As we can see, this means-end chain relates an attribute to two benefits, and to a more abstract end goal of fun and excitement and is seen on the bottom left part of Figure 2.3. This particular subject may think of five attributes, several benefits, and end goals for him related to selection of a ski destination. Other 89 subjects gave their response to ski resort selection criteria, and by carefully analyzing and aggregating their responses Klenosky et al. (1993) created a customer decision map (CDM) as shown in Figure 2.3. It links the attributes to a complex map of meanings classified into benefits and end goals based on their levels of abstraction. Such a map is a network diagram depicting key meanings associated with a product or service as shown in Figure 2.3.

Woodruff and Gardial (1996) provide a managerial guide that describes means-end analysis as one of the methods to understand customer value and satisfaction. They recommend using the output of customer interviews in terms of attributes and benefits to create value dimensions, which can subsequently be used to get customer ranking and weights to calculate overall satisfaction score. This research follows the laddering technique (Reynolds and Gutman, 1988) as described in the next chapter, and combines it with value dimension procedure of Woodruff and Gardial (1996) to create the framework of customer value in organizational buying. The mathematical procedure of Woodruff and Gardial (1996) is shown in the implication section in Chapter 6.

Figure 2.3: Hierarchical value map for ski destination choice (Klenosky et al., 1993; p.372)



Chapter 3

METHODOLOGY

In Chapter 2, we introduce the laddering technique of interviewing and conducting means-end analysis. This chapter begins by laying out research objectives, followed by description of the pretest study, research design, sample profile, laddering, and coding.

3.1 Research Objectives

Research objectives for this study are as follows:

- (a) To empirically examine customers' value dimensions in an organizational buying situation.
- (b) To develop an integrative theory-based framework of customer value in organizational buying using the empirical analysis.
- (c) To study differences in customer value dimensions for customers in different segments.

In the field of customer value in organizational buying, the variables are yet to be identified fully and we are still in the stage of understanding the linkages between product-supplier attributes and value perception. Therefore, an exploratory study using small sample is appropriate to build theory as recommended by Wilson (1987). The main aim of this research is to understand what customers value in a product by studying how they associate attribute level information to more abstract concepts of benefits and goals because attribute selection is goal directed. This study uses the laddering method of collecting and analyzing customer's perceptual information to achieve this aim. Section 3.5 describes the process. The description of the pretest follows.

3.2 Pretest

Pretest interviews were conducted with purchasing managers of three organizations in order to learn about (a) buying practices in organizations with different structures, (b) buying practices for different goods and services, (c) conducting interviews using laddering technique, (d) coding and analyzing data gathered. The background of the pretest participants is described below.

Organization 1: UGC university

This is one of the largest public universities in the country, located remotely from major cities. Mr. Candal, the chief institutional purchasing officer, described competitive bidding and contracting as the main method of purchasing the goods and services needed by the university. Occasionally, when repair and maintenance parts are needed urgently, the lowest price buying and bidding criteria are foregone in favor of immediate availability.

Organization 2: MNP, a manufacturer of components

MNP is a medium-sized company with annual sales of about \$200 million, employing about 750 people in central Pennsylvania. MNP manufactures ceramic chips, components, and capacitors (SIC 3295). It is a subsidiary of a Japanese company. According to Mr. Quest, the purchasing manager, MNP's annual purchases of raw material, factory supplies, packaging, office supplies etc. amount to approximately \$10 million. Its parent company centrally purchases production equipment and 60% of its raw material. Mr. Quest manages the remaining 40% of buying activities here in the U.S.

Organization 3: ABC, an original equipment manufacturer

ABC is a manufacturer of printed circuit board production equipment and chemistries (SIC 3823). They have annual sales of \$40 million, and employ 450 people. Though ABC is a subsidiary of a German company, the decision-making and purchasing activities are performed locally. Annual purchasing is approximately \$17-20 million. Mr. Davis, the materials manager, has been with the company for over 25 years. ABC buys motors, PVC plastic, aluminum, stainless steel, titanium, and office supplies from suppliers with whom they have long term relationships. On average, 80% of purchasing is done from long term suppliers. Ad hoc buying due to emergency needs for repair or replacement, for ABC or their customers, accounts for the remaining 20% of the total purchasing.

Organizations and people names have been changed to protect their privacy. Cooperation and appointments were sought during initial contact by telephone. The interview started with a brief explanation of the study and with the subject's consent to tape record the interview as required by the Human Subject Board. The permission form is given in Appendix C. In-depth, semi-structured personal interviews lasting about 1-2 hours were conducted with the three purchasing/materials managers. First general, unstructured, open-ended questions were asked about buying practices, organizational policies, and formal guidelines for evaluation and selection of products and vendors. This information pertained to number and types of suppliers, the nature of buyer-seller relationships, reasons for selecting and discontinuing a supplier, and so forth. After obtaining the overall frame of reference, the respondent was asked to list the features or characteristics important in supplier selection and retention. For each of the characteristics mentioned, they were asked the meaning of that characteristic. A series of "why is this important to you" questions were then asked as described by the laddering method in Section 3.5. Information gathered was transcribed, coded, and analyzed using content analysis and a software

called “Laddermap” by Gengler and Reynolds (1992). More details on such analysis for the main study are presented in Chapter 4.

3.3 Research Design

The buygrid framework for industrial buying situations by Robinson, Faris, and Wind (1967) shows that the information processing and supplier selection process is quite extensive when the buying situation involves purchasing a new product (New Task) or a product with modifications (Modified Rebuy). In addition, Johnson (1981) established that when an organization is involved in purchasing a piece of capital equipment, the buying center normally comprises of individuals from various departments and the buying process is fairly complex. The pretest study also indicated that MNC and ABC corporations had established standard procedures and relationships for purchasing raw materials needed on a regular basis. When purchasing high tech equipment for manufacturing, or support equipment such as a photocopy machine, computer, or communications equipment, the standard purchasing procedures were not applicable. Buying complex equipment involved personnel from different levels and functional areas in the organization, resulting in a complex buying process. In such a buying process, customers’ consideration set includes 3 or 4 different products as well as suppliers. Hence the buying process involves product as well as supplier evaluation and selection. Mr. Candal of UGC university mentioned that when a new technology or equipment was to be purchased, some of the purchasing procedures were changed and the buying center involved the actual users and other experts.

Therefore, in order to gain maximum understanding of the value perceptions of organizational buyers, a complex piece of telecommunication equipment, code named pronom, was selected as the product for this study. The names of organizations who had purchased a

prontom within the past 12-18 months were provided by Skycorp, a manufacturer of prontoms. Skycorp is a member of the Institute for the Study of Business Markets (ISBM) here at The Pennsylvania State University. The names of product and company have been changed to maintain their confidentiality. The buying center members interviewed in all the organizations considered prontoms a capital equipment purchase. The price range of prontoms was \$20,000-\$200,000 depending on the features of equipment and related services. Most of the respondents considered the buying situation to be either a new task or modified rebuy as the average life span of a prontom was 10 years. Even the respondents involved in a repeat purchase were required to study the newer products-use scenarios and hence were part of a diverse buying center and extensive decision making. Average size of buying center was 3. The number of people involved in the buying center ranged from one to five.

Skycorp provided the telephone numbers of a contact person in most organizations and identified a key decision-maker in some organizations. Cooperation of individual(s) involved in procuring prontom was requested during an initial telephone call. The interview started with a brief explanation of the study and written consent to tape record the interview as required by the Human Subject Board. The consent form is given in Appendix C. The study involved 60 subjects in 40 organizations. Participants received a Penn State mug as a token of appreciation. Each interview was approximately 45 to 60 minutes in length.

3.4 Respondent Profile

Table 3.1 gives the profile of the 40 organizations and 60 respondents involved in the research. The organizations and respondents represented different industries such as manufacturing, service, government, and institutions. There were 20 organizations where one

buying center member was interviewed, and there were 20 organizations where two buying center members were interviewed. In addition to studying value perceptions of the entire sample, customers were divided among five different buying patterns in order to examine differences among them as segments. The buying patterns of organizations were: (a) customers loyal to Skycorp, (b) customers who switched to Skycorp from a competitor, (c) customers loyal to a competitor, (d) customers who switched to a competitor from Skycorp, and (e) first time prompt buyers. The first four groups are called loyalty segments and are used for further analysis in the next chapter.

Table 3.1: Organization and Respondent Profile using different categories.

Classification Category	Number of Organizations	Number of Respondents
I. Type of Organization		
1. Manufacturing/Media	17	28
2. Service/Reseller	18	27
3. Govt/Institution	5	5
II. Buying Pattern Categories		
1. Skycorp loyal	12	15
2. Switched to Skycorp	9	14
3. Loyal to competitors	7	12
4. Switched to competitor	8	13
5. First time buyer	4	6

3.5 Laddering Method

For assessing customer's product knowledge or means-end structure, Reynolds and Gutman (1988) have offered a method called laddering that allows free-elicitation into a customer's semantic network of concepts or meanings. Their article titled "Laddering theory, method, analysis, and interpretation" (1988) is the main source of information in this section. Laddering involves an in-depth probing of customers in a tailored, one-on-one interview to uncover higher level meanings customers associate with product attributes. By asking a series of probes such as

“why is that important to you” we can obtain the perceptual links among the attributes, benefits, and end goals that provide information used by individuals as the basis for information processing and decision making for a product category. One way to start a laddering interview is with a triadic sorting of attributes of a product of three different brands (Reynolds & Gutman, 1988). For this research, triadic sorting was not feasible, as brands of prontom were many and varied in product line and features offered. In fact, the key objective of this research was to unearth the dimensions customers considered important to compare different brands and why. The focus here is on learning about organizational buyers’ purchasing process with respect to one product, with an assumption that what a customer considers important in a product is what delivers most value to them.

This study used an approach similar to the paper-and-pencil laddering interview used by Walker and Olson (1991). The laddering interviewer began by asking subjects to state the attributes that they considered important when purchasing prontom. For each of these attributes, the subjects described why it was important to them. To better understand the interviewing process, a series of questions are described below and the reason for asking each question is given in *Italics* under the question. According to the means-end theory, we can derive (1) meanings, (2) level of abstraction, and (3) causal associations based on the subjects’ responses. Laddering interviews allow us to understand the customers’ determinant attributes, the benefits they associate with those attributes, and the end goals to which they lead (Reynolds and Gutman, 1988).

(1) Think about the situation when you were involved in making the decision about buying a prontom for your organization. What attributes or characteristics did you consider while selecting the prontom?

(To learn the customer's determinant or important attributes for pronom)

(2) For each of the characteristics that you have listed in (1), I would like to know why it is important.

(A) Consider the first characteristic you mentioned in (1) above:

(i) Please describe in detail what you mean by this characteristic:

(To obtain the customer's meaning of the attribute)

(ii) Why is this characteristic important?

(To get the subject's perceived benefit associated with the first attribute)

(iii) Why is what you described in (ii) important?

(To get to the more abstract benefit or end goal associated with the first attribute)

(iv) Why is what you described in (iii) important?

(To get to the end goal associated with the benefit and the attribute by the respondent)

(B) Consider the 2nd characteristic you mentioned in (1) above:

Repeat the procedure for the subsequent key attributes mentioned by the subject for question 1 above and follow the same sequence.

The subjects' responses were written on the questionnaire as well as tape recorded for future clarification. Sample laddering questions developed for this study are given above. Appendix B contains the entire set of questions. To ease the subject into the interview we began with a set of demographic questions and open-ended questions about the pronom buying process, followed by laddering questions as described above. Having explained the repetitive nature of laddering questions at the outset, interviewees were cooperative and active participants in the interviews. Some of the subjects volunteered pronom-related stories or purchasing experiences. The average interview lasted 45-60 minutes.

3.6 Coding

The laddering interview information was recorded both on paper and a tape recorder. Tape recorded information was transcribed and verified with the written responses. Coding of these data involved several steps. First, all the interviews were read, reviewed, and content analyzed. Respondents' answers to laddering questions were recorded and classified in broad categories of attributes (A), benefits (B), and end goals (E). As seen above, laddering questions follow a sequence which generally provided us with responses in each of the A, B, and E categories. If some respondents did not have all the three categories of meanings, ladders are recorded only for the categories given by the respondents. In case of an answer being repeated, only one answer was considered. This coding process may be illustrated using a part of the interview with Mr. Scott, Technical Services Manager of Evening News, Inc., a newspaper publisher (all the names of people and organizations have been altered to protect their confidentiality). His response to each answer is given in *Italics* and the reason for asking each question is given in *Italics* in the parentheses below each answer.

(1) Think about the situation when you were involved in making the decision about buying a prontom for your organization. What attributes or characteristics did you consider while selecting the prontom?

- (i) *Uniform call distribution (UCD)*
- (ii) *Voice mail*
- (iii) *One switch installation technology*
- (iv) *Service features*
- (v) *Knowledgeable sales rep*

(To learn Mr. Scott's determinant or important attributes for evaluation and selection of prontom and its supplier)

(2) For each of the characteristics that you have listed in (1), I would like to know why it is important.

(A) Consider the first characteristic you mentioned in (1) above:

Uniform call distribution (UCD)

(i) Please describe in detail what you mean by this characteristic:

"It allows the incoming calls for classified ads to be uniformly distributed among all the sales staff."

(To obtain Mr. Scott's meaning of the attribute)

(ii) Why is this characteristic important?

“We are in the newspaper business and pronom is very essential for bringing in ad revenue for the company. For me it was important to look at uniform call distribution because it allows the incoming calls to be distributed equally and create the same work load among all the sales staff.”

(To get Mr. Scott’s perceived benefit associated with the attribute of UCD)

(iii) Why is what you described in (ii) important?

This is good for our company’s finances.

(To get to the more abstract benefit or end goal associated with the attribute of UCD in Mr. Scott’s perceptions)

(iv) Why is what you described in (iii) important?

What is more important than our company’s profits?

(To get to the end goal associated with the benefit and the attribute by Mr. Scott)

(B) Consider the 2nd characteristic you mentioned in (1) above:

Voice mail

The procedure was repeated for the second key attribute, voice mail, mentioned by Mr. Scott for question 1 above and the same sequence was followed.

Here is an illustration of a means-end chain using Mr. Scott’s interview given above. The first attribute (A) was mentioned by Mr. Scott as uniform call distribution (UCD) in question 1. He

linked it to the benefit (B) of “same work load among all the sales staff” which was put in a code “equal work load for employees”, which he linked to the end goal (E) of financial health. This means-end chain is depicted as:

Uniform Call Distribution → Equal Work Load → Financial Health

Similar to the process of creating this means-end chain, four more means-end chains are obtained based on Mr. Scott’s key attributes listed in question 1 above, namely, voice mail, one switch installation technology, service features, knowledgeable sales rep. Combined, the five ladders or means-end chains provide Mr. Scott’s cognitive structure of knowledge about pronom based on his perceived causal relationships between meanings at different levels of abstraction (Olson & Reynolds, 1983). It explains how and why he selected a number of attributes of pronom to make a decision about comparing and eventually selecting a specific brand of pronom, enabling him, in his perception, to achieve desired end states for the organization and himself.

After an iterative process of refining and reclassifying the meanings in general categories of attribute, benefit, and end goal, summary codes were developed for all the A, B, E which were meaningful and broad enough for all the ladders. As Reynolds and Gutman (1988) contend, “one wants to achieve broad enough categories of meaning to get replications of more than one respondent saying one element leads to another. Yet, if the coding is too broad, too much meaning is lost” (p. 18-19). They recommend a reliability check by multiple coders. These codes were checked by another doctoral student and an MBA, and had a 95% agreement rate the first time. All the differences were resolved until 100% agreement was achieved. Table 3.2 on the next page lists the final codes developed for this research, comprised of 20 attribute codes, 16 benefit codes, and 7

end goal codes; making a total of 43 variables. Each respondent had four or five ladders, totaling 290 ladders for 60 respondents. These data were entered in a software program called “Laddermap” developed by Gengler and Reynolds (1992) for further analysis. Laddermap allows each ladder to be entered with its A, B, E codes and linkages to aggregate responses for all the subjects (Klenosky et al., 1993). Aggregate relationships among all the A,B, E responses were turned into an asymmetric implication matrix as depicted in Chapter 4.

The raw data of 290 ladders were also coded in a binary method for each of the 43 variables, with 1 if the variable was mentioned, and 0 if the variable was not mentioned. These data were used for cluster analysis as described in the next chapter.

Table 3.2: List of codes

Attributes	Benefits	End goals
Voice mail	Faster transmission	Survival
Expandability	Saves time	Competitive advantage
Project cost	Equal workload	Financial health
Service cost	No missed calls	Job satisfaction
Past performance	Efficient resource use	Accomplish mission
Remote servicing	Less risk	Job security
Product review	Improved productivity	Customer satisfaction
Technology	Less downtime	
Sales person expertise	Solves problem	
User friendly	Meet future needs	
Transmission speed	Avoid obsolescence	
Transmission capacity	Work environment	
Uniform call distribution	Communication quality	
Supplier reputation	Supplier credibility	
Delivery	Job performance	
Service contract features	Saves money	
Existing Infrastructure		
Reliability		
Quality		
Staff availability		

Chapter 4

ANALYSIS

Chapter 3 was concluded with a description on coding and entering of the laddering data as attributes, benefits, and end goals into a software program called “Laddermap” by Gengler and Reynolds (1992). Laddermap allows each ladder to be entered with its A, B, E codes and linkages to aggregate responses for all the subjects (Klenosky et al., 1993). It then allows us to create quantitative data in the form of an implication matrix “which displays the number of times each element leads to each other element” (Reynolds and Gutman, 1988, p.20). In this chapter, we first present the implication matrix developed for this study and use it to examine customers’ value dimensions in prompt buying decisions, which is the first objective of this research. In the next section the attributes, benefits, and end goals derived in this empirical analysis are further analyzed for different loyalty segments, i.e. the customers that were: (a) loyal to Skycorp, (b) switched to Skycorp from a competitor, (c) loyal to a competitor, and (d) switched to a competitor from Skycorp. Section 4.3 presents the cluster analysis procedure and results. This analysis was carried out to achieve the third objective of this research, i.e., to study differences in the customer value profile among different segments.

4.1 Implication Matrix and Value Dimensions

The means-end links in an implication matrix in Table 4.1 show respondents’ perception of the causal relationship between the attribute, benefit, and end goal concepts underlying customers’ prompt choice (Mulvey et al., 1994). The relationships among the means-end chain concepts are both direct and indirect.

FROM:		TO:																									
		Attributes					Benefits										End Goals										
Attributes		Frequency	A11	A20	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	E1	E2	E3	E4	E5	E6	E7
A1	PROJECT COST	31			18		12	1													1						
A2	USER FRIENDLY	23				1	8					8	1	2	5						1				1		
A3	VOICE MAIL	22										19		2	2				1								1
A4	EXPANDABILITY	21		2	14														3								
A5	TECHNOLOGY	20			9			2	2		1	1	3	2				2									
A6	REMOTE SERVICING	19	4					2	2	11							2		2		1					1	
A7	SERV FEATURES	18	1			7		2	1	2		3	1	1												1	
A8	SALES PERSON EXPERTISE	18				3		1	6	1		5		5			2									1	
A9	SERVICE COST	15			9			6	4												1					1	
A10	EXISTING INFRASTRUCTURE	15			4		4	4	4		1	1		4												1	
A11	RELIABILITY	15			4		2		1	2	1	1		4	2						2		1	1		1	
A12	TRANSMISSION SPEED	13			2										2			9									
A13	DELIVERY	12			2			2	1	2							5										
A14	PAST PERFORMANCE	12	2	1		3	1	4					1														
A15	REPUTATION	11				2	3	2		2																	
A16	PRODUCT REVIEW	9	1	1	2	2		3																			
A17	TRANSMISSION CAPACITY	8						1				1			4			2									
A18	STAFF AVAILABILITY	8						2	2	1							3									1	
A19	UCD	8						2	2						1												
A20	QUALITY	8				2	1	1		1		2														1	
Benefits																											
B1	SAVES MONEY	33																			6	18					
B2	MEET FUTURE NEEDS	30					1														22		1	1			3
B3	LESS RISK	28						1				1			1						5		16	3			
B4	EFFICIENT RESOURCE USE	26																			7	13	1		1		2
B5	IMPROVED PRODUCTIVITY	25																			5	9	2	2			4
B6	SUPPLIER CREDIBILITY	22																			6		12	1			2
B7	LESS DOWNTIME	21														1					6	4	2	1	5		2
B8	NO MISSED CALLS	19							1					2							1	1	1	4	7		2
B9	JOB PERFORMANCE	18																			7		4	1			1
B10	SOLVES PROBLEM	15												1		1					2	1	2	5	2		
B11	COMMUNICATION QUALITY	14																			1	3		1	3	4	2
B12	WORK ENVIRONMENT	13																			3	1	3	1	2		2
B13	SAVES TIME	12																			4	1			3	2	
B14	FASTER TRANSMISSION	11						1																			
B15	EQUAL WORKLOAD	8														1											
B16	AVOID OBSOLESCENCE	5																			5						
End Goals																											
E1	SURVIVAL	85																									
E2	FINANCIAL HEALTH	61																									
E3	JOB SECURITY	45																									
E4	JOB SATISFACTION	28																									
E5	COMPETITIVE ADVANTAGE	23																									
E6	CUSTOMER SATISFACTION	20																									
E7	ACCOMPLISH MISSION	16																									

Table 4.1: Aggregate Implication Matrix

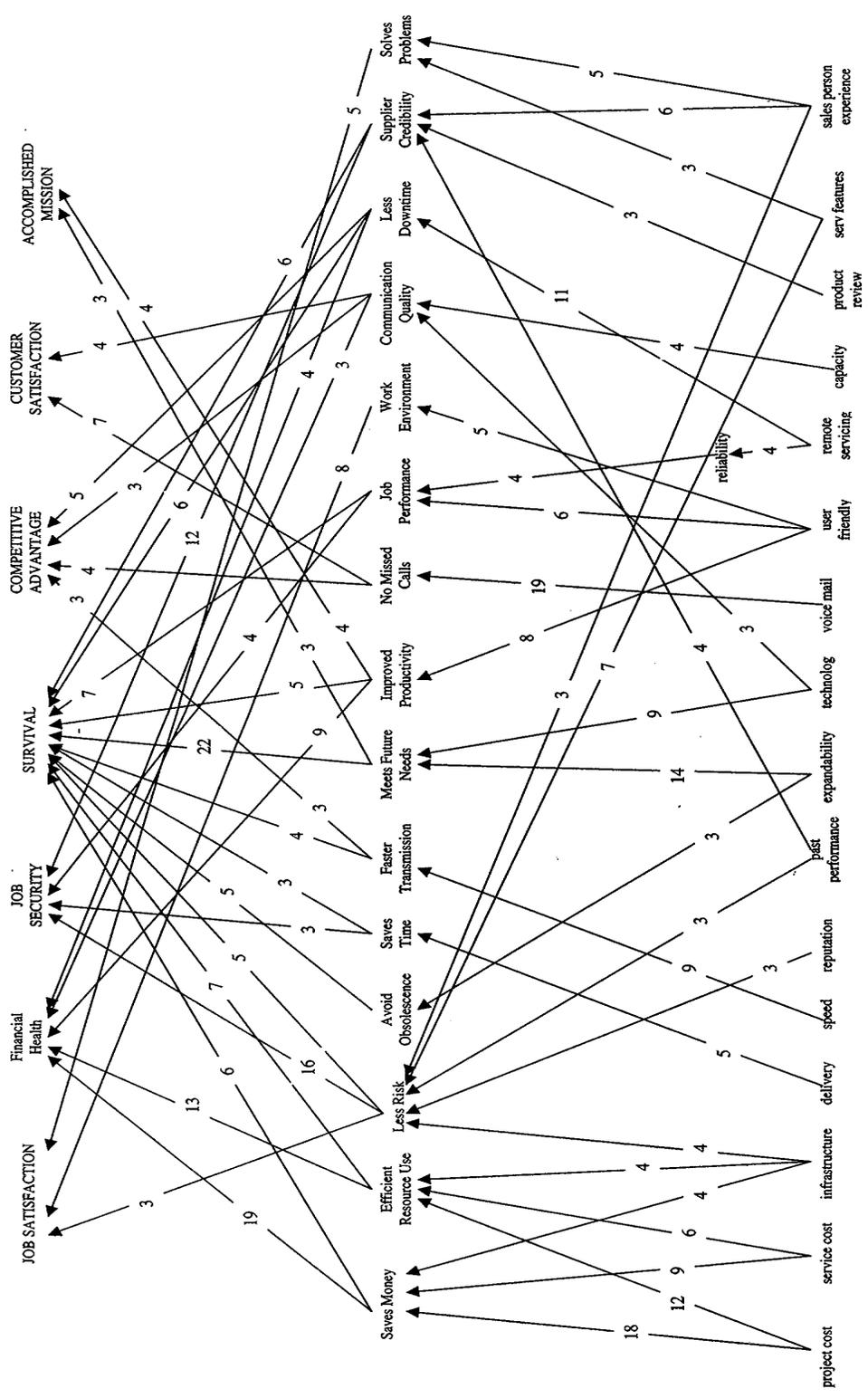
The means-end chain $A \rightarrow B \rightarrow E$ contains two direct relationships from A to B and B to E, and one indirect relationship from A to E (Klenosky et al., 1993). Only direct relationships are shown in the implication matrix in Table 4.1 in order to focus on the links between attributes and benefits; and benefits and end goals as depicted by means-end theory. In Mr. Scott's example described in the previous chapter, one ladder was: uniform call distribution (UCD) \rightarrow equal workload \rightarrow financial health. In the implication matrix this ladder will show one direct link between UCD and equal workload, and another direct link between equal workload and financial health. Since there were very few within- attributes links, only those columns of attributes are shown in Table 4.1 where some within-attribute links were present in the implication matrix to save space. "The entries in the matrix show the number of times a concept (the row) directly elicited each of the other concepts (the column). These entries provide the basis for constructing the Hierarchical Value Map" (Klenosky et al., 1993, p.370). Such a map for this study, called here Customer Decision Map (CDM) as recommended by Olson, is given in Figure 4.1 on the next page. While creating the CDM from the implications matrix, links of 3 or more were considered to avoid excessive clutter in the figure.

CDM presents an aggregate map containing a network of causal links between attributes, benefits, and end goals, based on the implication matrix. At the bottom of the hierarchy in Figure 4.1 are attributes; in the middle are benefits; and at the top in uppercase are end goals. Numbers in lines between two variables indicate the frequency of association between them as seen in the implication matrix. For example, the line between the attribute "expandability" to the benefit "meets future needs" indicates that 14 respondents linked these two variables. Close examination of Table 4.1 and Figure 4.1 together reflect the same information presented in two different ways. Table 4.1 is an aggregate set combining the input from 60 respondents in the study, giving us an

overall view of customers' semantic network of meanings and causal links. Marketers also have an option to examine these links at an individual customer/organization level to learn what they consider important, and why, in making prompt buying decisions.

Alpert (1971) recommended identifying determinant attributes for a product which he defined as "those attributes projected by the product's image which lead to the choice of that product may be called determinant since they determine preference and purchase" (p.184). We modify this definition of determinant attributes to include those attributes that customers consider salient when making buying decisions. The list of 20 attributes of prompt emerging from this study can be called determinant attributes, as these attributes were identified by customers to be salient while making purchase decisions. The 16 benefits identified by respondents provide a comprehensive list of what the determinant attributes are supposed to do for customers and their organizations. The seven end goals which the benefits help the customers and their organizations achieve, are also what drive the customers' choice process, according to means-end theory. Woodruff and Gardial (1996) call these sets of attributes, benefits and end goals 'value dimensions' because they drive customers' perception of prompt's value. The customer decision map in Figure 4.1 presents all the value dimensions for prompt.

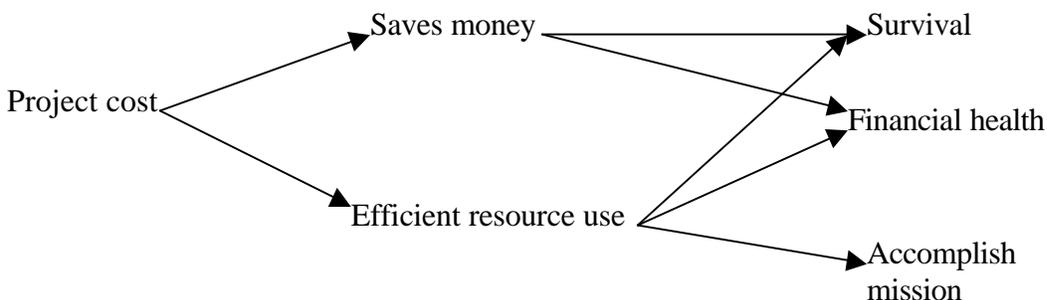
Figure 4.1: Customer Decision Map for prontom buyers



Let us refer to Figure 1.1 and to the basic questions with which this inquiry started, i.e., (1) how are evaluation criteria formed in buying center members, and (2) how are individual preferences formed in buying center members? Using the means-end analysis we can now see that organizational customers, while examining the evoked set of alternatives of a product category, create mental or perceived attribute-benefit-end goal (means-end) type value dimensions, which they use to compare and evaluate different brands and suppliers of the product in their consideration set. Associations in the implication matrix in Table 4.1 are used in the analysis below to explain the value dimensions in detail for each of the 20 attributes. The purpose of this analysis is to unearth the links between attributes and benefits which underlie buying decisions for promptom customers, and use this knowledge to build a customer value framework discussed in the next chapter. Links greater than 1 are selected from the implication matrix to create the maps related to each attribute to gain deeper glimpse of customer's product knowledge. For Skycorp, it would be important to understand each value dimension to position its promptom.

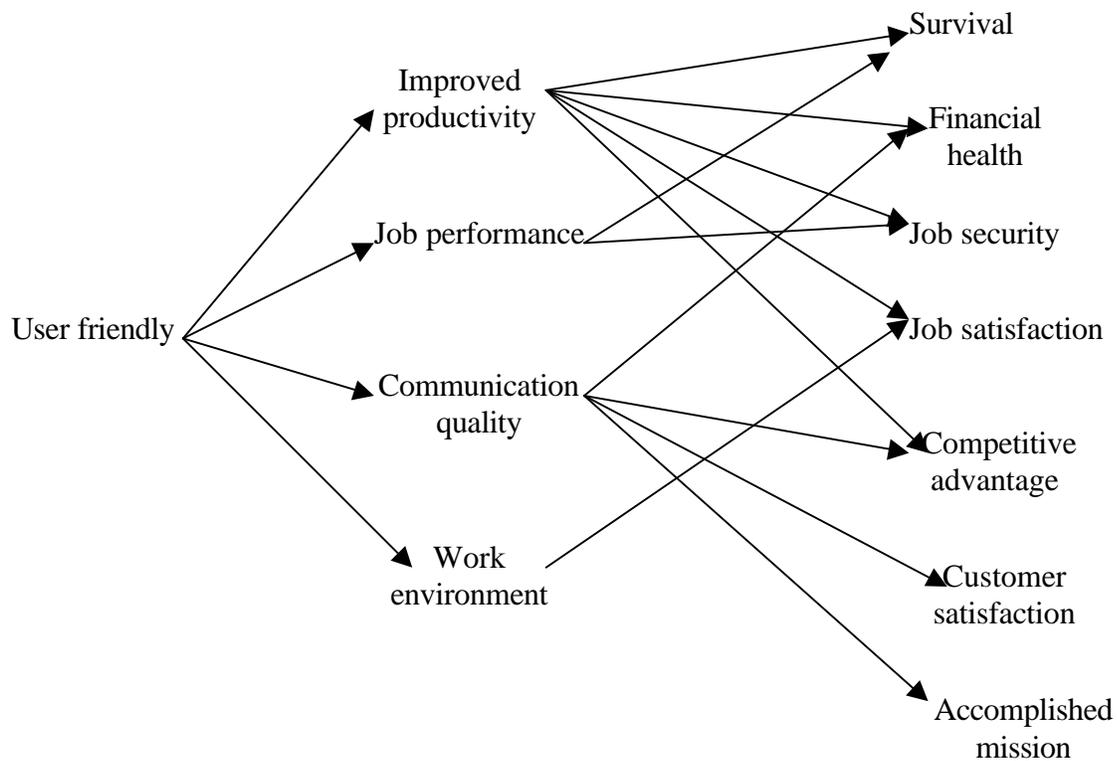
4.1.1 Project cost

Project cost incorporates such concepts mentioned by customers in the interviews as low price, system price, delivery and installation costs. As we can see below, project cost has two connotations: one is ‘low price’, which is associated with the benefit of ‘saves money’; and the other is ‘appropriateness’ or ‘right price for the right product’, which is associated with the benefit of ‘efficient use of resources’. It is important to demarcate the customers who just want the lowest priced alternative and those who want what they consider “a right product at the right price”. Traditionally, value of a product has been closely associated with its price in marketing (e.g. Zeithaml, 1988; Gale, 1994). In the organizational buying scenarios where a high tech or complex product with auxiliary services is involved, such as in the case of a pronom, project cost varies wisely among alternatives because of different product and service features involved. Project cost was the most mentioned attribute by 31 respondents (51.67%); out of which 18 respondents associated it with the benefit ‘saves money’, and 12 respondents associated it with the benefit ‘efficient resource use’. Subjects associated these two benefits with end goals of survival, financial health, and accomplish mission.



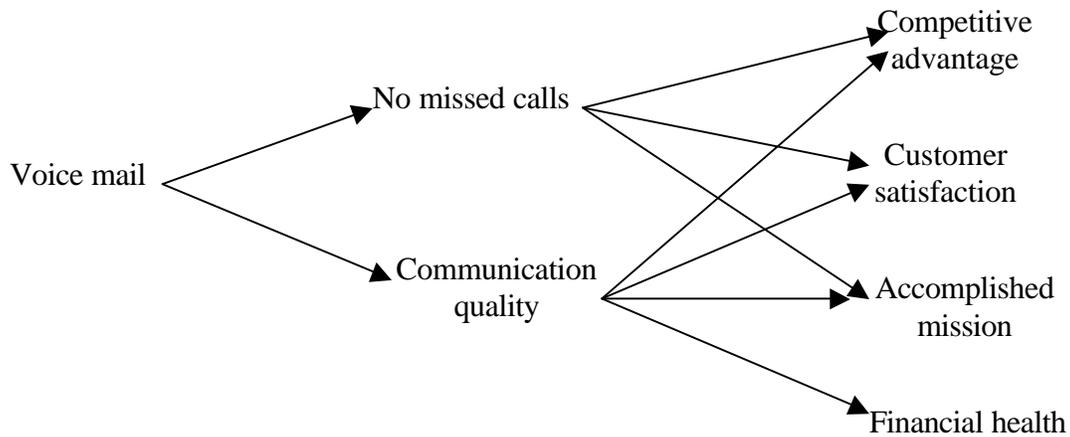
4.1.2 User friendliness

User friendliness includes the terms expressed by pronom customers in this study as easy to use, easy to learn, hassle-free, and user friendly. This was the second most mentioned attribute, by 23 respondents (38.33%), and was linked with four key benefits: improved productivity, job performance, work environment, and communication quality; which in turn are linked to all seven end goals. Business marketers have to pay close attention to not only what the purchasing staff considers important but also what the actual users consider how user friendly their product is. In this study, several respondents were actual users since they were part of the buying center.



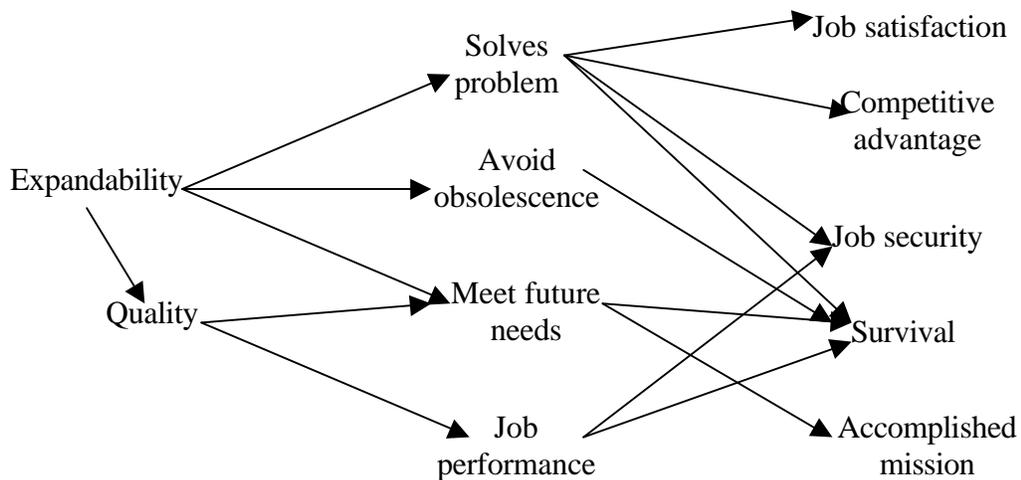
4.1.3 Voice mail

Many brands of prontoms come with a voice mail feature that eliminates the need of humans having to take messages allowing callers to leave a voice message if they wish. This feature was mentioned by 22 (36.67%) prontom customers as it allowed them to retrieve messages and gave them the assurance that they did not miss any important calls. Telecommunication is an integral part of any organizational functioning, allowing users to stay in touch with their own customers and other associates. Voice mail was also linked to communication quality because it facilitated the user leaving outgoing messages for clients and checking their feed back. These benefits were linked by buyers to end goals of competitive advantage, customer satisfaction, accomplishing their organization's mission and better financial health.



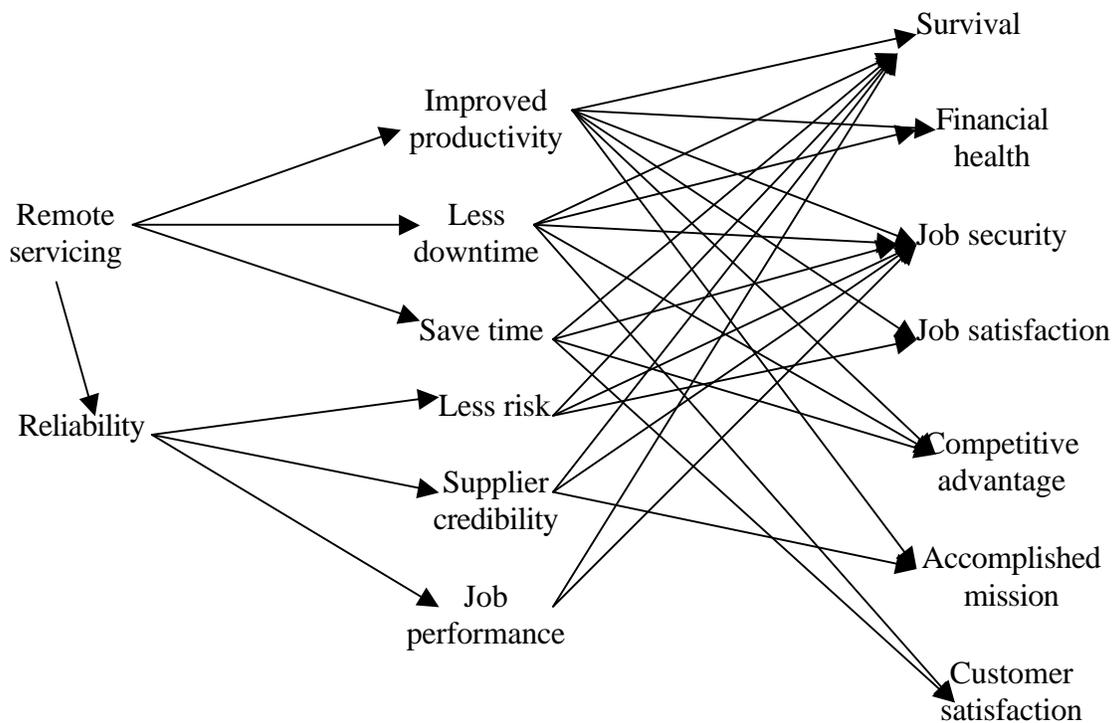
4.1.4 Expandability

As many organizations grow, they want to be able to expand their existing telecommunication system to meet their new needs rather than buy a new system. Therefore, 21 respondents (35%) mentioned expandability as a key buying attribute. Two respondents also associated expandability with quality. Expandability was linked with the following benefits: “avoid obsolescence”, “solves problem”, “meet future needs”, and “job performance” (linked to quality). Some older models of prontom could not be expanded when new lines or features were needed.



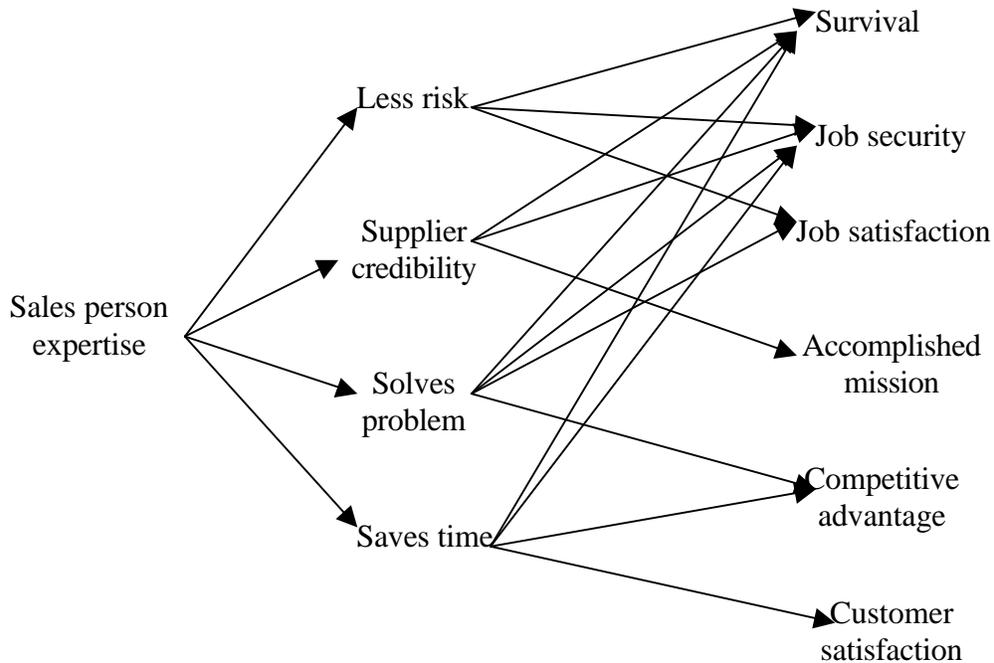
4.1.5 Remote servicing

Supplier's ability to fix minor problems in a prompt remotely through a computer was a feature offered by Skycorp and a few other suppliers. This attribute was mentioned by 19 respondents (31.67%) and was linked with the benefits of less downtime, improved productivity, and saving time. Remote servicing was also linked to reliability which, in turn was linked to the benefits of less risk, job performance, and supplier credibility.



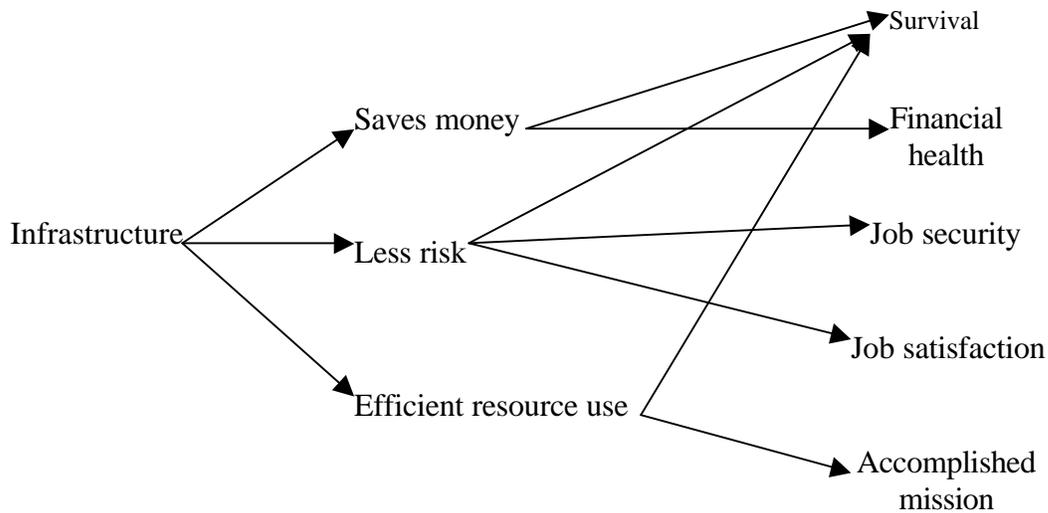
4.1.6 Sales person expertise

In products involving complex technology and substantial financial outlay such as pronom, the buying decision process is complex and may involve an active role from a manufacturer's or channel member's sales personnel. The knowledge and ability of the sales personnel to help customers through the buying process were perceived by pronom buyers to be important. Out of 18 respondents (30%) who mentioned sales person expertise as a key attribute, 6 linked it to "supplier credibility", and the rest linked it to "less risk", "solves problems", and "saves time".



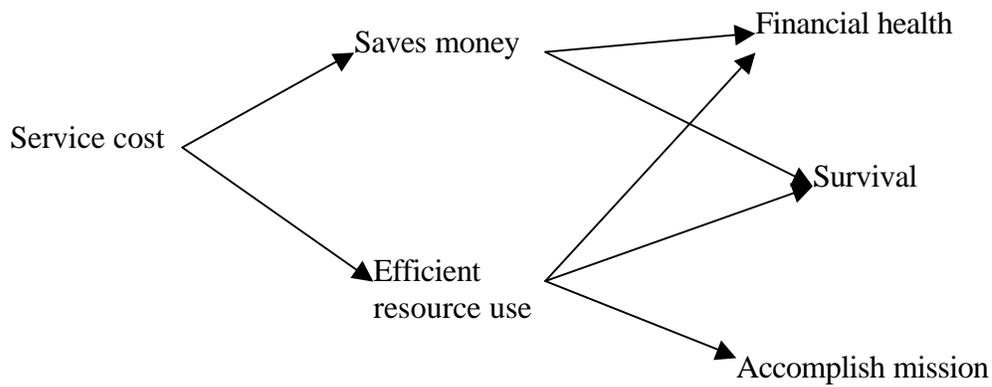
4.1.7 Existing infrastructure

For customers who were purchasing a new prontom system for their organization because the old one was obsolete some of them wanted to use the infrastructure or certain peripherals of the old system. At the time of interviews, different technologies available for prontoms were often incompatible with each other, so if a customer switched supplier of prontom, their old infrastructure would be useless. Therefore, this was one of the main reasons for loyalty to the prontom supplier for 15 customers (25%). They saw the benefits of “less risk”, “saves money”, and “efficient resource use” for utilizing the existing infrastructure. As a result of the importance of the existing infrastructure to potential repeat customers, many manufacturers of prontoms now incorporate technology that is compatible with different configurations of prontoms.



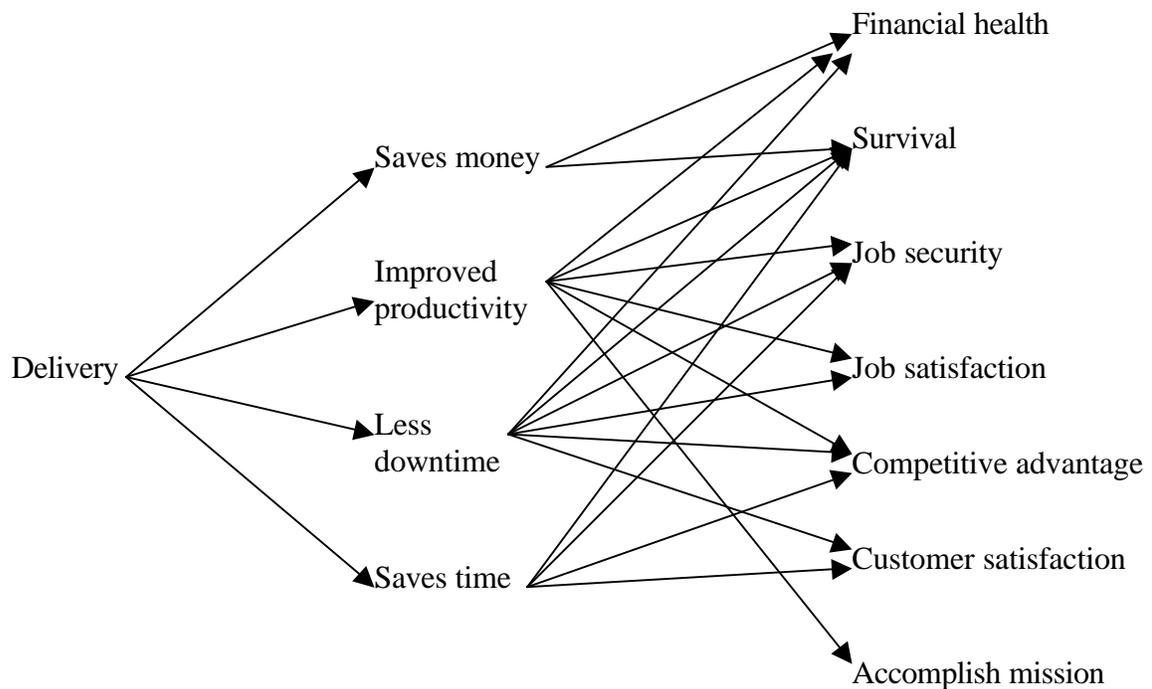
4.1.8 Service cost

In addition to repair and maintenance service contracts, some pronom manufacturers provided related telecommunication services both as bundled with pronom and as individual services. Sometimes the cost of certain maintenance services was included in the system price quoted to the potential customers, and sometimes it was not. Hence service cost was a salient attribute mentioned by 15 buyers (25%) and had same meanings,, benefits, and end goals associated with it as the project cost.



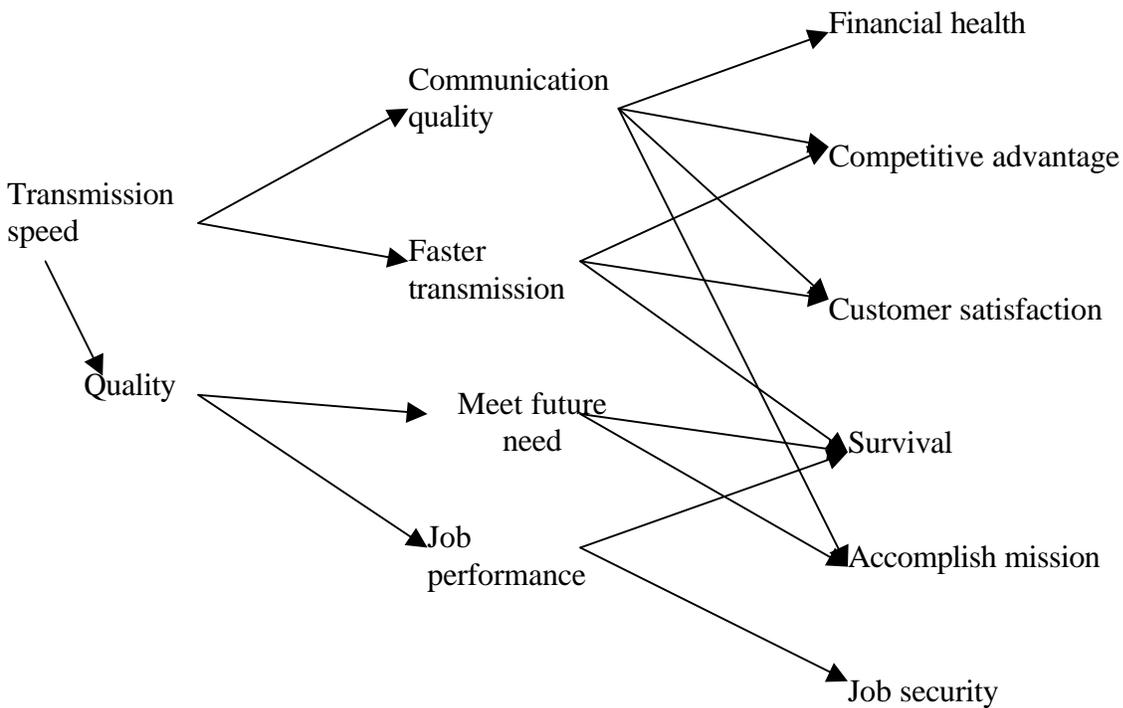
4.1.9 Delivery

Many customer organizations dealt with operational deadlines for new pronom systems. For them the date of delivery and installation of new pronom was an important attribute. The suppliers who can meet not only the system requirements, but also the delivery deadline would be considered favorably by these customers. This attribute was mentioned by 12 respondents (20%) and was linked with the benefits of saves money, improved productivity, less downtime, and saves time, which in turn are linked to all seven end goals.



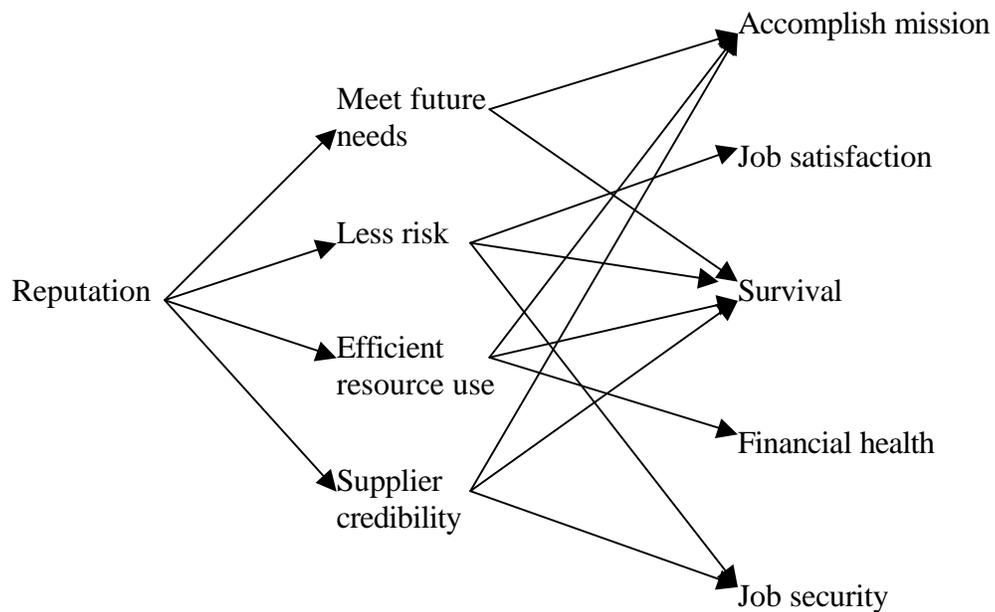
4.1.10 Transmission speed

Transmission of voice as well as data is an important function of a pronom and its speed was considered a determinant attribute by 13 respondents (21.67%). It was linked with the benefits of 'communication quality and 'faster transmission'. Two respondents linked it to the quality of a pronom, which was in turn associated with the benefits of 'meet the future needs' and job performance.



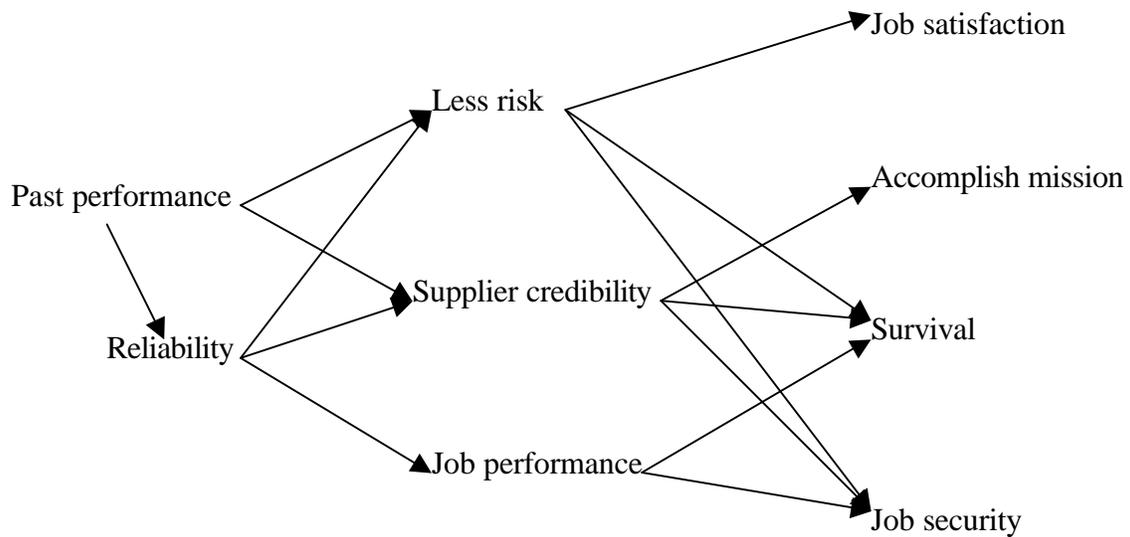
4.1.11 Product-supplier reputation

For a complex capital good such as pronom, 11 organizational buyers (18.33%) considered positive supplier and product reputation a determinant attribute. The benefits associated with this attribute were 'meet future needs', 'less risk', efficient resource use, and 'supplier credibility'. Peers, consultants, other customers, and channel members are some of the sources for negative or positive reputation of a certain product or a supplier.



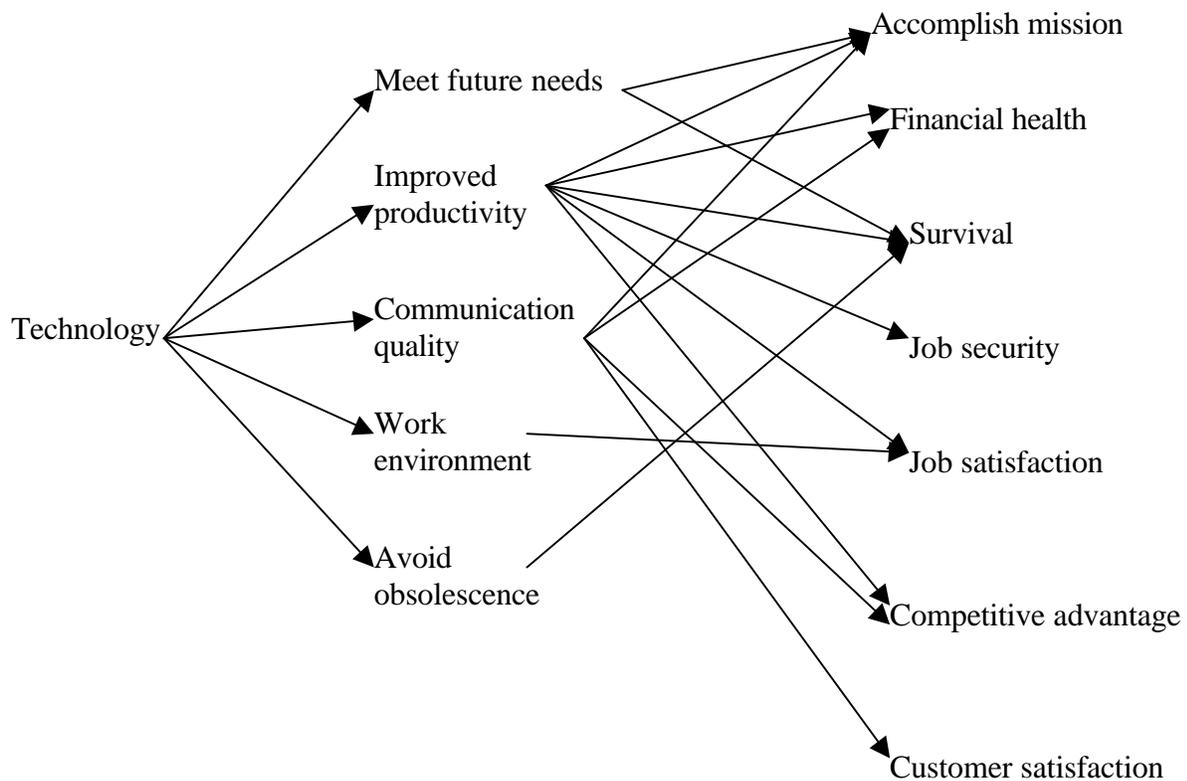
4.1.12 Past performance

Out of the 60 respondents in the study, 90% were from organizations that had bought a product before. Hence past performance was a determinant attribute for 12 respondents (20%), out of which two respondents linked it with reliability. The benefits associated with this attribute were 'less risk', 'supplier credibility, and job performance'.



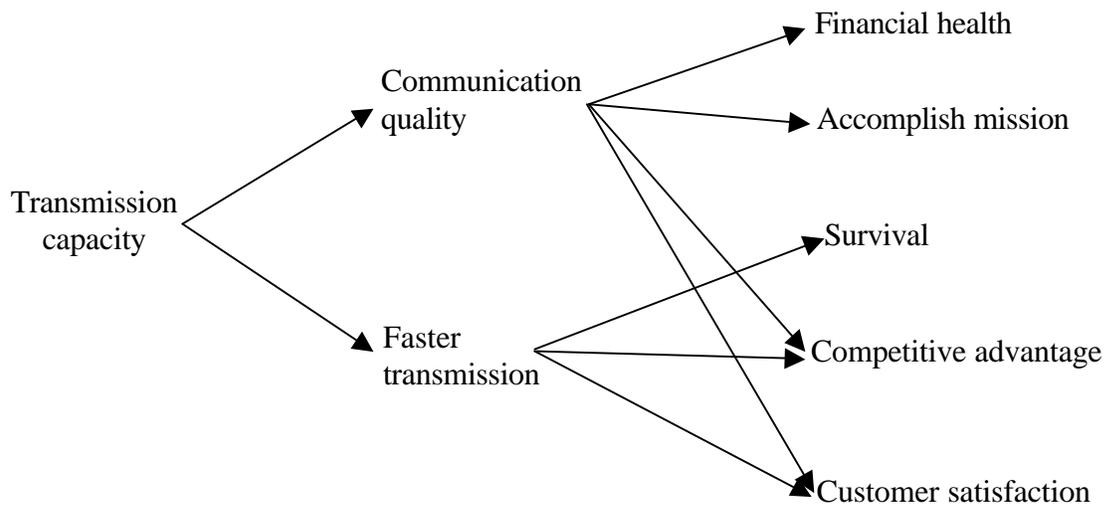
4.1.13 Technology

Technology used for pronom was an important attribute for 20 respondents (33.33%). With the many choices of pronom available to customers, the pronom with the newest technology had the benefits of 'meet future needs', 'improved productivity', 'communication quality', 'work environment,' and 'avoid obsolescence'.



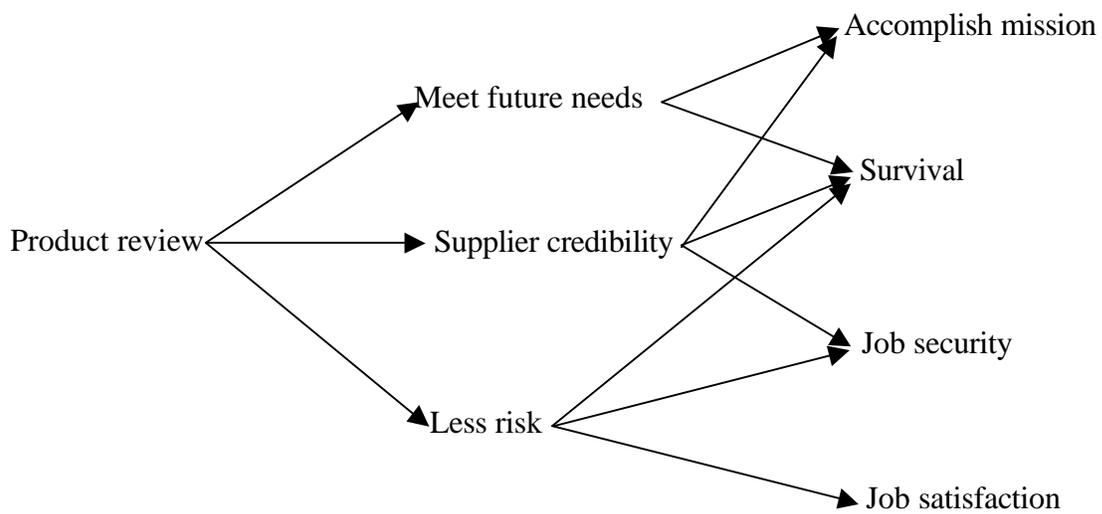
4.1.14 Transmission capacity

The capacity of a prontom model to transmit voice and data information varies. This attribute was mentioned by 8 respondents (13.33%) and was linked with ‘communication quality’ and ‘faster transmission’.



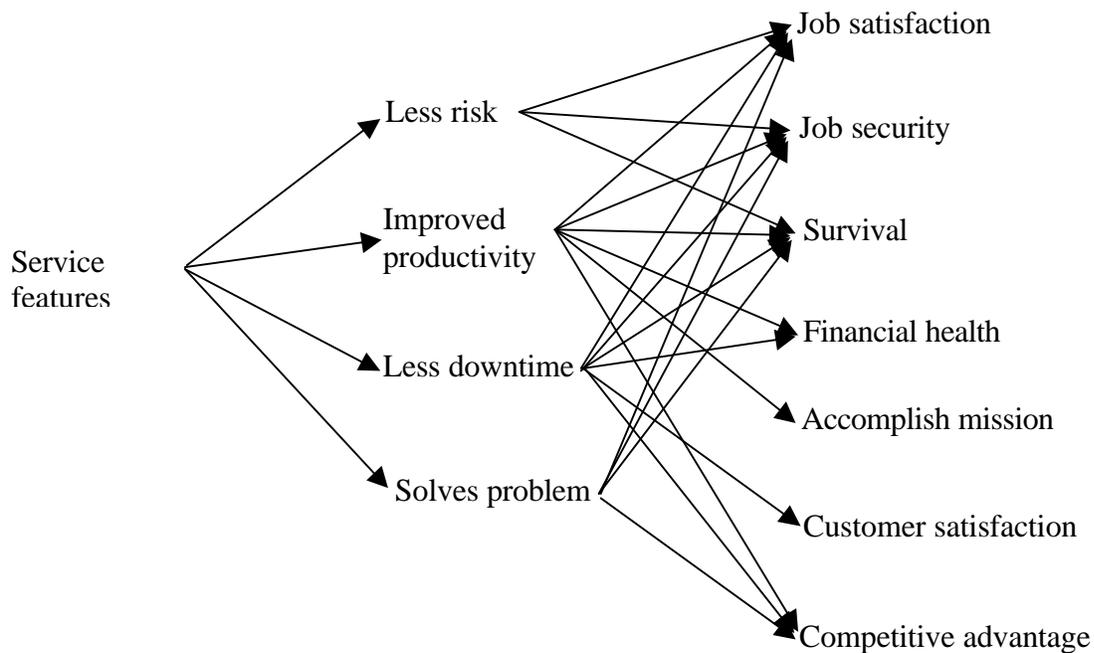
4.1.15 Product review

Many trade journals and technical publications provide product reviews for high tech products like smartphones. For some respondents, such reviews are important because they help them make evaluation and purchase decisions. This attribute was mentioned by 9 respondents (15%), and was linked with 'meet future needs', 'supplier credibility', and 'less risk'.



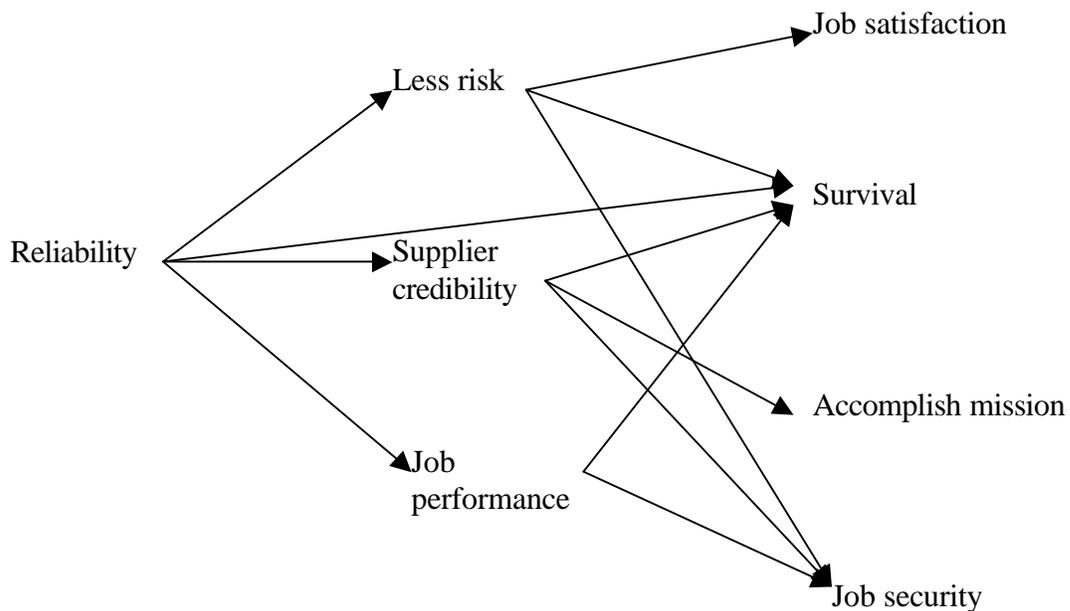
4.1.16 Service features

What kinds of repair, maintenance, and other services were available from the potential suppliers was a determinant attribute for 18 respondents (30%). For a high tech product which is also a backbone of telecommunications of an organization, service features are almost as important as product features. The benefits linked to desired service features were 'less risk', improved productivity', 'less downtime', and 'solves problems'.



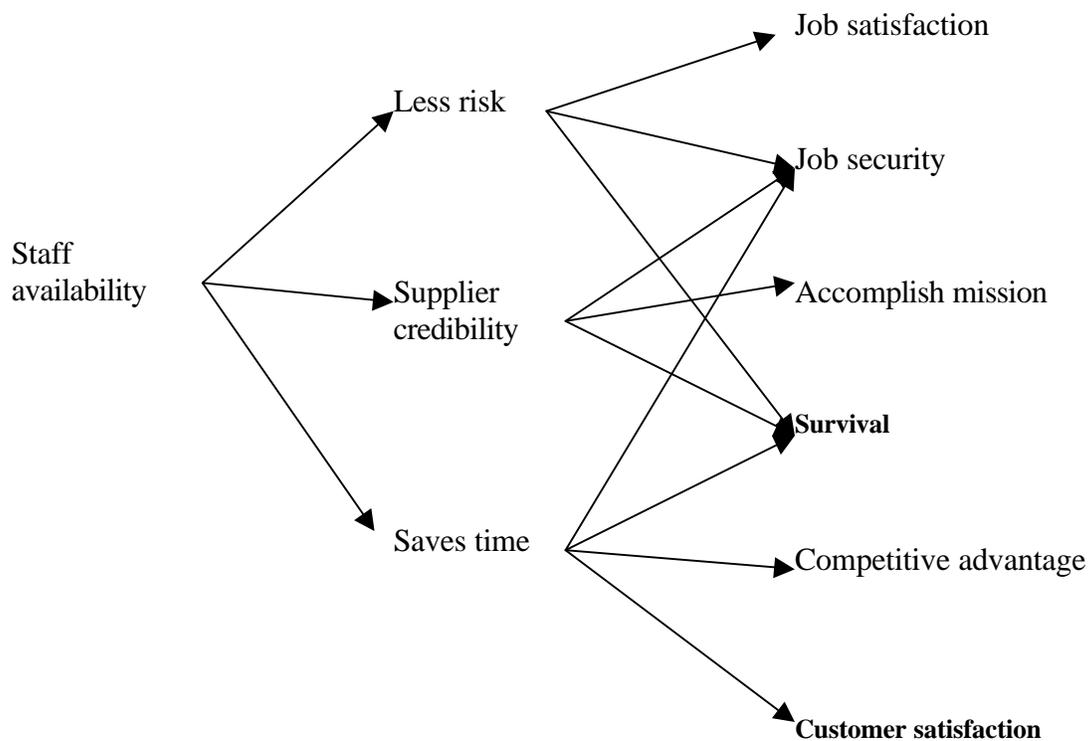
4.1.17 Reliability

Reliability of prontm was considered a determinant attribute by 15 respondents (25%) who linked it to the benefits of 'less risk', 'supplier credibility', and 'better job performance'. Two respondents also linked reliability directly to the end goal of organizational survival. Also as seen in the descriptions of attributes so far, remote servicing capability, and past performance of a prontom were also linked to reliability by some respondents.



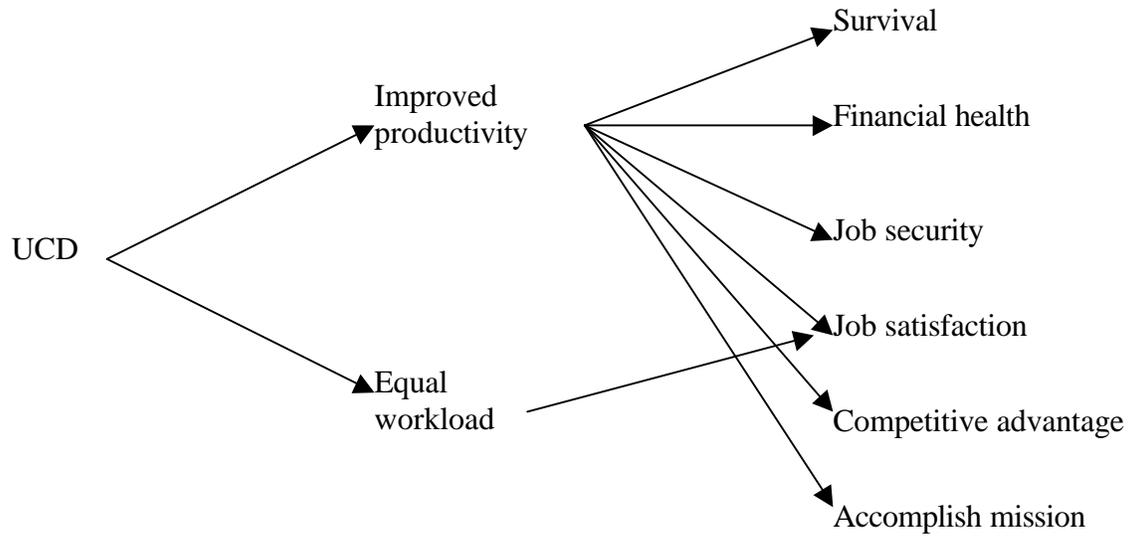
4.1.18 Staff availability

Availability of sales and service staff when needed either personally or on the telephone was an important attribute for 8 respondents (13.33%). In times when most customer service is handled by automated answering system or computers, the customers of high tech equipment often need human help. This attribute was linked to the benefits of 'less risk', 'supplier credibility', and 'saves time'.



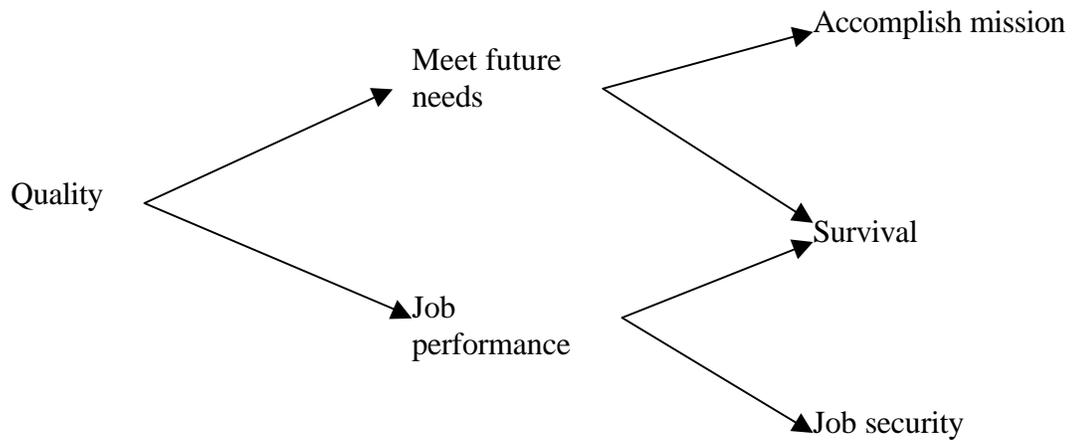
4.1.19 Uniform call distribution (UCD)

The ability of a pronom to direct the incoming calls equally among available call center personnel was considered a determinant attribute by 8 respondents (13.33%). The benefits associated with this feature were 'improved productivity' and 'equalize workload', which in turn were linked to all seven end goals.



4.1.20 Quality

Quality of a pronom was mentioned by 8 respondents (13.33%) as a key attribute and was linked to the benefits of 'meet future needs' and 'job performance'. It was also linked with the attributes of transmission speed and expandability as seen earlier.



4.2 Analysis Based on Segments

In this research, pronom buyers were classified into four loyalty segments based on their repeat purchase pattern. The four categories of customers are: (a) loyal to Skycorp, (b) switched to Skycorp from a competitor, (c) loyal to a competitor, and (d) switched to a competitor from Skycorp. Information on the number of respondents from each of these four categories and the number of first buyers was given in Table 3.1. Since laddering applies to customers' knowledge structure pertaining to the product category level rather than at the brand level, further analysis was conducted to study differences and similarities among attributes mentioned by the respondents in four loyalty segments. Data on the total number of times each concept of attribute, benefit and end goal was mentioned is given in the Table 4.2. Using the raw frequency data in Table 4.2, proportions were created for each category in Table 4.3. Each number represents the proportion of a particular response by subjects in that particular loyalty segment, out of the total number for that response. For example, project cost as a determinant attribute for making pronom buying decisions was mentioned eight times by the subjects in the "Skycorp loyal" category. Dividing that by 31, which is the total number of times project cost was mentioned (by the entire sample), gave us the proportion 0.258 or 25.8% in the first box in Table 4.3 below.

This analysis was carried out to understand possible differences among customers in different loyalty segments on how they may compare different brand/suppliers of pronoms. This is the first step toward achieving objective 3 as laid out in Chapter 1, i.e., to study differences in customer value profiles among customers in different segments. For this analysis, the top five proportions for attributes were sorted in to a 2*2 matrix in Figure 4.2. The number in the parentheses is proportion of response. Based on visual analysis of the matrix and Table 4.2, we

have developed the following profile of customers in each loyalty segment, followed by a profile of new buyers.

First, a review of the U.S. pronom market during the time frame of field research (between 1994-1996) is in order. The market was divided among three major manufacturers, called Tier 1 suppliers, and several smaller manufacturers, called Tier 2 suppliers. Skycorp was a market leader but was losing market share to the other two big manufacturers in Tier 1, as well as to Tier 2 suppliers. The total pronom market fluctuates with business cycles, i.e., pronom demand increases when new businesses open and old ones expand. There was a range of pronom available in the market, in terms of product features, services, and price. Skycorp was generally perceived to be a supplier of reliable pronom with desired features such as uniform call distribution capability (UCD), but was also perceived to be higher priced supplier among customers. The other two Tier 1 suppliers were getting closer to Skycorp in terms of perception of reliability and product quality, but their products were still considered lower in price. Tier 2 suppliers were considered “low quality-low price” but they made up by providing some new features and after sales services. Skycorp’s strategy so far was to remain as a “high price-high quality” supplier, and had a wide range of other products and services to offer the pronom buyers, as well as other telecommunications customers. However, this strategy needed to be examined as the market was stagnating and market share was declining. Therefore, the goal of this analysis was to understand the customer’s perceptions of determinant attributes and what they sought from these attributes. With this background, we will now discuss the profiles of customers in loyalty segments, and new buyers.

4.2.1 Profile of Skycorp loyal customers

Skycorp had a high rate of customer retention (about 70 per cent). Those customers who stayed loyal to Skycorp did so because they emphasized pronom attributes such as quality, transmission speed, product review, reliability, availability of sales and technical staff, and uniform call distribution (UCD) feature (Figure 4.2). This indicates that pronom customers evaluated other product-suppliers on these attributes, hence, these are their value determinant attributes. When discussing the attribute project cost, it was mentioned earlier that there are organizational customers who follow the heuristic of buying the lowest priced product. Then there are those customers who weigh other attributes and justify the higher price and, as in this study, mentioned the benefit of efficient use of resources. Porter (1985) and Gross (1978) have called this price premium 'value created by suppliers'.

4.2.2 Profile of customers who switched to Skycorp

The customers who switched from a competing supplier of pronom to Skycorp mentioned four product-service attributes: capability of remotely servicing the pronom, voice mail, transmission speed, and UCD, in addition to reputation and staff availability as determinant attributes. Many customers dissatisfied with pronom from other suppliers consider Skycorp as a safer choice as Skycorp is recognized as market leader and has been around for a long time, hence the project cost was not mentioned at all by any respondent in this loyalty segment (see Table 4.3).

Table 4.2: Frequency of responses for 5 buying patterns and overall

		Skycorp loyal	Switched to Skycorp	Loyal to Competitor	Switched to Competitor	First time buyer	Overall
	<i>Number of Respondents (n)</i>	15	14	12	13	6	60
Attributes							
A01	Project cost	8		12	11		31
A02	User friendly	4	4	7	6	2	23
A03	Voice mail	1	10	2	4	5	22
A04	Expandability	3	7	4	5	2	21
A05	Technology	5	4	1	7	3	20
A06	Remote servicing	5	9		1	4	19
A07	Service features	6	5	1	4	2	18
A08	Sales person expertise	6	6	2	3	1	18
A09	Service cost	2	1	4	8		15
A10	Existing Infrastructure	5		10			15
A11	Reliability	6	3	2	1	3	15
A12	Transmission Speed	6	5	1		1	13
A13	Delivery	2	2	3	4	1	12
A14	Past performance	3		9			12
A15	Reputation	3	5		1	2	11
A16	Product review	4	2		2	1	9
A17	Transmission Capacity	3	2	1		2	8
A18	Staff availability	3	3		1	1	8
A19	UCD	3	3		2		8
A20	Quality	4	2			2	8
Benefits							
B01	Saves money	4	1	13	15		33
B02	Meet future needs	5	10	5	6	4	30
B03	Less risk	5	9	8	3	3	28
B04	Efficient resource use	13	2	7	4		26
B05	Improved productivity	10	6	3	3	3	25
B06	Supplier credibility	7	5	3	4	3	22
B07	Less downtime	5	8		4	4	21
B08	No missed calls	1	9	1	3	5	19
B09	Job performance	4	3	3	5	3	18
B10	Solves problem	4	3	4	3	1	15
B11	Communication quality	3	4	1	4	2	14
B12	Work environment	6	2	3	1	1	13
B13	Saves time	3	2	3	3	1	12
B14	Faster transmission	3	6	1		1	11
B15	Equal workload	1	2	1	2	0	6
B16	Avoid obsolescence	3	1		1		5
End goals							
E1	Survival	18	20	19	18	10	85
E2	Financial health	20	7	14	18	2	61
E3	Job security	9	11	11	9	5	45
E4	Job satisfaction	8	10	4	4	2	28
E5	Competitive advantage	4	11	3	2	3	23
E6	Customer satisfaction	4	5	2	6	3	20
E7	Accomplish mission	5	2	3	3	3	16

Table 4.3 Proportions of responses for loyalty segments and first time buyer.

		Skycorp loyal	Switched to Skycorp	Loyal to Competitor	Switched to Competitor	First time buyer
Attributes						
A01	Project cost	0.258		0.387	0.355	
A02	User friendly	0.174	0.174	0.304	0.261	0.087
A03	Voice mail	0.045	0.455	0.091	0.182	0.227
A04	Expandability	0.143	0.333	0.190	0.238	0.095
A05	Technology	0.250	0.200	0.050	0.350	0.150
A06	Remote servicing	0.263	0.474		0.053	0.211
A07	Service features	0.333	0.278	0.056	0.222	0.111
A08	Sales person expertise	0.333	0.333	0.111	0.167	0.056
A09	Service cost	0.133	0.067	0.267	0.533	
A10	Existing Infrastructure	0.333	0.000	0.667		
A11	Reliability	0.400	0.200	0.133	0.067	0.200
A12	Transmission Speed	0.462	0.385	0.077		0.077
A13	Delivery	0.167	0.167	0.250	0.333	0.083
A14	Past performance	0.250		0.750		
A15	Reputation	0.273	0.455		0.091	0.182
A16	Product review	0.444	0.222		0.222	0.111
A17	Transmisson Capacity	0.375	0.250	0.125		0.250
A18	Staff availability	0.375	0.375		0.125	0.125
A19	UCD	0.375	0.375		0.250	
A20	Quality	0.500	0.250			0.250
Benefits						
B01	Saves money	0.121	0.030	0.394	0.455	
B02	Meet future needs	0.167	0.333	0.167	0.200	0.133
B03	Less risk	0.179	0.321	0.286	0.107	0.107
B04	Efficient resource use	0.500	0.077	0.269	0.154	
B05	Improved productivity	0.400	0.240	0.120	0.120	0.120
B06	Supplier credibility	0.318	0.227	0.136	0.182	0.136
B07	Less downtime	0.238	0.381		0.190	0.190
B08	No missed calls	0.053	0.474	0.053	0.158	0.263
B09	Job performance	0.222	0.167	0.167	0.278	0.167
B10	Solves problem	0.267	0.200	0.267	0.200	0.067
B11	Communication quality	0.214	0.286	0.071	0.286	0.143
B12	Work environment	0.462	0.154	0.231	0.077	0.077
B13	Saves time	0.250	0.167	0.250	0.250	0.083
B14	Faster transmission	0.273	0.545	0.091		0.091
B15	Equal workload	0.167	0.333	0.167	0.333	
B16	Avoid obsolescence	0.600	0.200		0.200	
End goals						
E1	Survival	0.212	0.235	0.224	0.212	0.118
E2	Financial health	0.328	0.115	0.230	0.295	0.033
E3	Job security	0.200	0.244	0.244	0.200	0.111
E4	Job satisfaction	0.286	0.357	0.143	0.143	0.071
E5	Competitive advantage	0.174	0.478	0.130	0.087	0.130
E6	Customer satisfaction	0.200	0.250	0.100	0.300	0.150
E7	Accomplish mission	0.313	0.125	0.188	0.188	0.188

Figure 4.2: Top 5 attributes mentioned by respondents in four segments.

	Skycorp	Competitor
Loyal to –	Quality (0.500) Transmission speed (0.462) Product review (0.444) Reliability (0.400) Transmission capacity (0.375) Staff availability (0.375) UCD (0.375)	Past performance (0.750) Existing infrastructure (0.667) Project cost (0.387) User friendly (0.304) Service cost (0.267)
Switched to –	Remote servicing (0.474) Voice mail (0.455) Reputation (0.455) Transmission speed (0.385) Staff availability (0.375) UCD (0.375)	Service cost (0.533) Project cost (0.355) Technology (0.350) Delivery (0.333) User friendly (0.261)

4.2.3 Profile of competitor loyal customers

The respondents who stayed loyal to competitors did so because they were satisfied with past performance of the existing brand of pronom their organization had used, and they had an infrastructure that was suitable for the existing brand of pronom. Project cost, user friendliness, and service cost were other leading reasons. As mentioned above, Skycorp pronom was perceived by some customers as higher priced and so were their product maintenance service or other telecommunication services. Therefore, project and service costs were mentioned by both competitor's loyal customers and those who switched to competitors from Skycorp, as mentioned below. In addition to project and service costs, the determinant attributes for customers in this segment were technology, delivery, and user friendliness. Many times the smaller, Tier 2 suppliers were able to attract customers of Skycorp and Tier 1 suppliers by lower priced product, and by responding quickly by customizing a pronom to a customer's desired technology, product feature, or delivery schedule.

4.2.4 Profile of customers who switched to a competitor

In addition to project and service costs, the determinant attributes for customers in this segment were technology, delivery, and user friendliness. Many times the smaller, Tier 2 suppliers were able to attract customers of Skycorp and Tier 1 suppliers by lower priced product, and by responding quickly by customizing a pronom to a customer's desired technology, product feature, or delivery schedule.

4.2.5 Profile of first time buyers of pronom

Since the pool of first time pronom buying organizations provided by Skycorp was limited, the total number of respondents from this category was only six as compared with 54 in the repeat buyers of the previous four loyalty categories (see respondent profile in Table 3.1). However, analysis of the proportions of responses in Table 4.3 suggests that the first time buyers considered quality, transmission capacity, voice mail, remote servicing, and reliability as determinant attributes.

4.3 Cluster Analysis

Cluster analysis has been performed in many studies where the means-end analysis method was used. The ski destination study cited in Chapter 2 by Klenosky et al. (1993) presented a six cluster grouping of skiers' means-end links. Botschen et al. (1999) used cluster analysis for benefit segmentation based on laddering interviews of students on their expectations of quality of sales personnel in clothing specialty shops. Cluster analysis is used here as a second way to achieve objective 3 of this research, namely, to study differences in customer value profiles among customers in different segments.

Statistical Analysis System (SAS) was used to perform cluster analysis on the binary data entered for each of the 43 attribute, benefit, and end goal concepts. As explained in Chapter 3, in addition to entering data into Laddermap for the 290 ladders obtained in the interviews, binary data were entered using 1 if a concept was mentioned or 0 if the concept was not mentioned.

SAS offers two procedures for such analysis – PROC FASTCLUS and PROC CLUSTER. The FASTCLUS procedure performs a disjoint cluster analysis on the basis of distances computed from one or more quantitative variables (SAS Online help document for Release 8.02). The observations are divided into clusters such that every observation belongs to one and only one

cluster; the clusters do not form a tree structure as they do in the CLUSTER procedure. By default, the FASTCLUS procedure uses Euclidean distances, so the cluster centers are based on least-squares estimation. This kind of clustering method is often called a *k-means model*, since the cluster centers are the means of the observations assigned to each cluster when the algorithm is run to complete convergence. Each iteration reduces the least-squares criterion until convergence is achieved. The FASTCLUS procedure is intended for use with large data sets, with 100 or more observations. The data set for this research contains 290 observations, thus appropriate for PROC FASTCLUS.

The data set was analyzed using PROC FASTCLUS with different numbers for clusters. The value of the Pseudo F Statistic was compared to determine the optimum number of clusters. For this data set, the optimum number of clusters was six. The results from the SAS procedure gives many details including the analysis for each of the 290 observations, indicating the cluster that an observation belongs to and the distance from seed value, which initially is assigned as either 0 or 1 for each variable. The procedure determines the final seed value and reports cluster summary indicating the number of observations (frequency) contained in each cluster and distance between cluster centroids along with a few other statistical parameters. Finally, matrices for cluster means and cluster standard deviations are presented as shown in Appendix D. Using these matrices, one can group the variables within each cluster. The variable belongs to a cluster for which it has the highest value of mean and standard deviation. Since PROC FASTCLUS determines cluster for each observation based on the variable reported in that observation, that variable is assigned to that particular cluster for which it has the highest value of mean and standard deviation. Frequency of respondents in each cluster is as follows:

Cluster 1: 50, Cluster 2: 30, Cluster 3: 28, Cluster 4: 81, Cluster 5: 76, and Cluster 6: 25.

There are total 43 variables, of which 20 represent attributes, 16 represent benefits, and 7 represent end goals. In order to differentiate among the terms representing attributes, benefits, and end goals in the cluster table, attributes are listed using all lower case, benefits are listed using first letter upper case, and the end goals are listed all upper case. Table 4.4 shows the variables in each of the six clusters. As we can see, each cluster indicates a different value dimension or what Klenosky et al. call “chain of meaning” (1993, p.373) pronom buyers use while making a choice. Referring to the implication matrix in Table 4.1, cluster 5 represents the predominant attributes of project cost, service cost, remote servicing, existing infrastructure linked to benefits of efficient resource use, less downtime, and saves money; all leading to the end goal of financial health of the organization. Cluster 4 and 6 represent smaller but more precise mean-end chains. Clusters also show clear links between attributes, benefits and end goals that explain the customers’ perceptions behind the pronom buying process.

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
Frequency = 50	Frequency = 30	Frequency = 28	Frequency = 81	Frequency = 76	Frequency = 25
product review	past performance	technology	expandability	project cost	voice mail
sales person expertise	speed	user friendly	Meet Future Needs	service cost	No Missed Calls
serv features	capacity	ucc	Avoid Obsolescence	remote servicing	Improved Productivity
staff availability	delivery	reputation	SURVIVAL	Infrastructure	COMPETITIVE ADVANTAGE
Less Risk	reliability	Equal Workload		Efficient Resource Use	ACCOMPLISH MISSION
Supplier Credibility	quality	Solves Problem		Less Downtime	
JOB SECURITY	Faster Transmission	Work Environment		Saves Money	
	Saves Time	JOB SATISFACTION		FINANCIAL HEALTH	
	Communication Quality				
	Job Performance				
	CUSTOMER SATISFACTION				

Table 4.4: Six clusters classification using cluster analysis

Chapter 5

FRAMEWORK OF CUSTOMER VALUE

In the previous chapter we examined the value dimensions or means-end knowledge structure of prompt buyers and discussed the differences among customers from different segments. In this chapter, the first section deals with the classification of all the attributes, benefits, and end goals derived in the empirical analysis in the previous chapters. The second section presents the framework of customer value in organizational buying based on the classification, means-end theory, and marketing literature. The key purpose behind developing the framework is to explain what customers value, i.e., consider important in making organizational buying decisions, and why.

5.1 Classification of Value Dimensions

In order to develop a generalized framework of customer value that can be applied and tested for a wide range of products and organizational buying situations, we start with classifying all the value dimensions emerging from the empirical analysis into broader categories as depicted in Table 5.1.

5.1.1 Classification of attributes

In traditional means-end analysis product attributes are classified as concrete attributes and abstract attributes. Peter and Olson 1993 defined concrete attributes as “tangible, physical characteristics of a product” and abstract attributes as “intangible, subjective characteristics of a product” (p. 92). Zeithaml (1988) classified attributes in four different categories: intrinsic versus

extrinsic, and objective versus perceived. Wilson (1986) classified attributes that organizational customers consider while making buying decisions into three categories: product attributes, company (supplier) attributes, and salesperson attributes. Hansotia, Shaikh, and Sheth (1985) proposed four categories of attributes for product positioning: determinant versus nondeterminant and differentiating versus nondifferentiating attributes. We classify all the attributes described by respondents to be salient while making prompt buying decisions in six categories as follows. (1) Product features such remote servicing and uniform call distribution, (2) service features such as maintenance and repair contracts, and bundled services, (3) total project cost or price, (4) service cost, (5) supplier attributes such as reputation and past performance record, and (6) sales staff attributes such as their expertise and availability. This classification of attributes has been depicted in the left most column of Table 5.1 One can further classify the product, supplier, service, and sales person attributes in these categories.

5.1.2 Classification of benefits

Peter & Olson (1993) state that “the meaning of an attribute is given by the consequences consumers perceive that it leads to” (; p.100). Customers consider certain attributes important because of the consequences they provide. The classification of consequences used traditionally is functional consequences and psychological consequences. “Functional consequences include the physical, tangible, performance outcomes of using a product” (Peter & Olson, 1993; p. 93). Psychological consequences comprise both social and psychological consequences that customers associate with certain attributes. In this research we have used the term benefit to convey positive consequences. Shapiro and Jackson (1978) classified benefits in the industrial market as functional, operational, financial, and personal. Anderson, Jain, and Chintagunta (1993) used

similar classification in their definition of value: economic, technical, service and social benefits. Based on our empirical analysis we classify the benefits customers seek from attributes into 3 categories. (i) Functional or operational benefits such as less downtime, and communication quality; (ii) economic or financial benefits such as low maintenance cost, improved productivity, and efficient resource use; and (iii) social and psychological benefits such as equal workload, less risk, improved performance. This is reflected in middle column of Table 5.1.

5.1.3 Classification of end goals

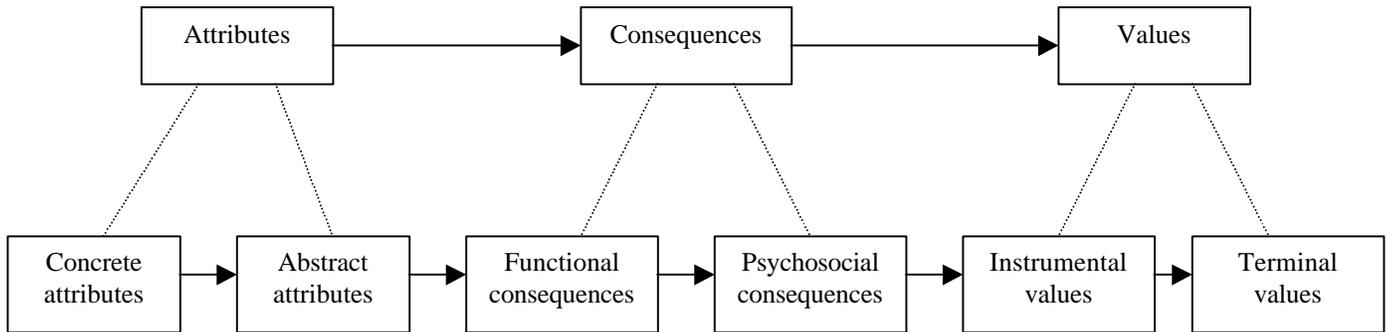
As mentioned earlier, the means-end theory posits that end goals determine the desirability of benefits, and the benefits in turn, determine the importance or salience of attributes (Reynolds, 1985). Traditionally in means-end analysis, based on the classification by Rokeach (1973), end goals have been categorized as “instrumental values” which are the desirable modes of conduct and “terminal values” which are the desirable end-states of existence (Olson, 1988). While making buying decisions for the organizations, the context of organization as well as individual is an integral part of the decision process for the buying center members. In this study we observe interplay of organizational and individual influences. As a member of an organization, a buyer associates benefits to organizational interests or objectives such as long-term survival, profitability and achievement of its mission, which have been grouped here as organizational end goals. At the same time, a buying center member, as an individual, has a set of individual end goals, such as job satisfaction and job security. End goals are depicted in the right most column in Table 5.1.

Table: 5.1 Classification of attributes, benefits, and end goals

Attributes	Benefits	End goals
1. Product features	1. Functional benefits	1. Organizational goals
Quality	Improved job performance	Customer satisfaction
Voice mail	Faster transmission	Survival
Expandability	Avoid obsolescence	Competitive advantage
Remote servicing	Equal workload	Financial health
Uniform call distribution	No missed calls	Accomplish mission
Transmission speed	Meet future needs	
Transmission capacity	Less downtime	2. Individual goals
User friendliness	Improved productivity	Job satisfaction
Technology	Communication quality	Job security
Existing Infrastructure fit	Solves problem	
2. Service features	2. Economic benefits	
Service contract features	Saves time	
Bundled services	Efficient resource use	
3. Price/Project cost	Saves money	
4. Service cost		
	3. Social benefits	
5. Supplier attributes	Better work environment	
Past performance	Less risk	
Product review	Supplier trust	
Reliability		
Delivery		
6. Sales staff attributes		
Sales person expertise		
Staff availability		

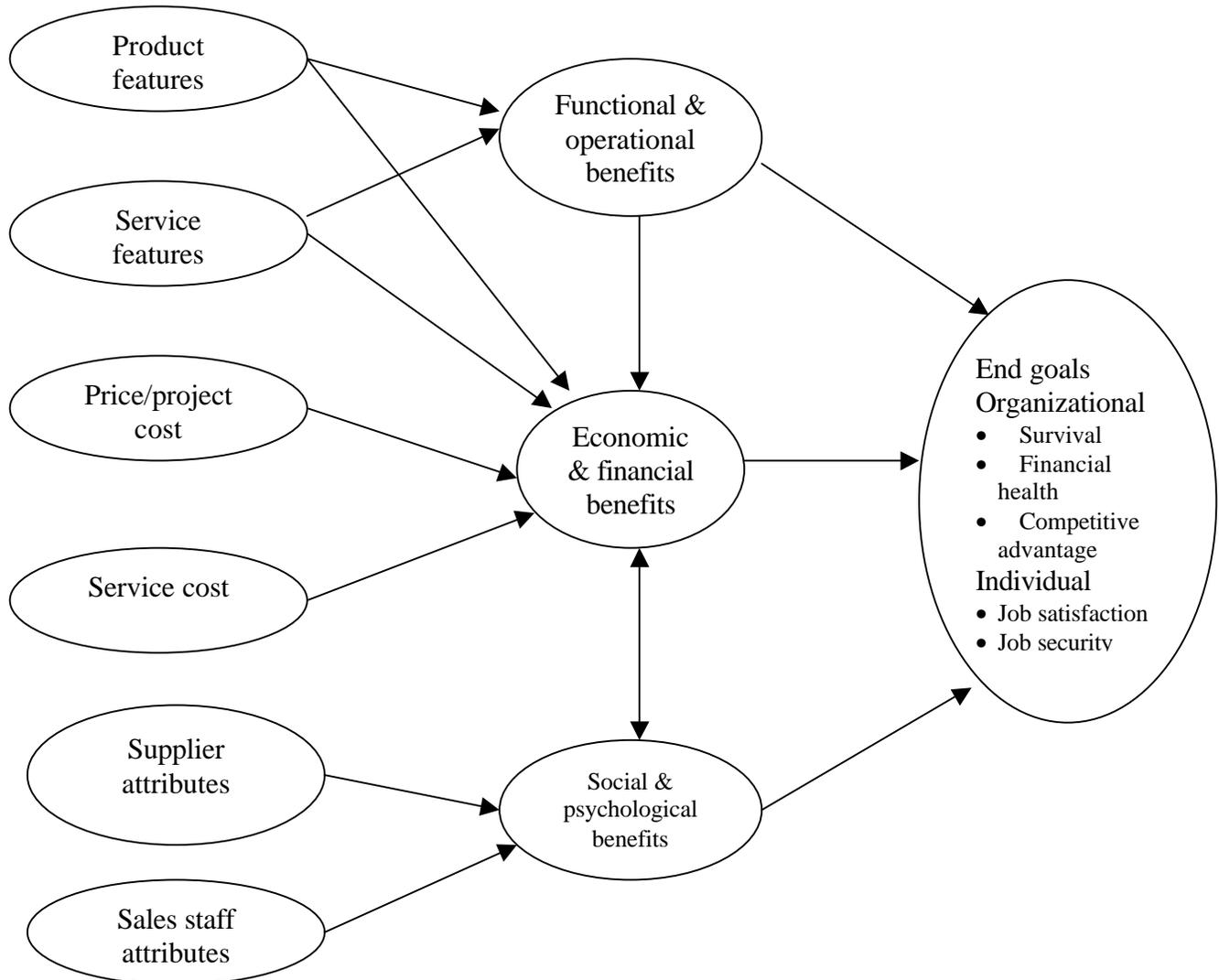
5.2 Framework of Customer Value in Organizational Buying

Peter and Olson (1993, p. 100) depicted the general means-end chain of a customer's product knowledge as follows:



“From a means-end chain perspective, the meaning of an attribute is given by consequences it leads to-‘What is it good for?’ or ‘What does it do for me?’ That is, a product attribute is seen as a means to an end. The end could be either an immediate consequence (a benefit or risk) or a more abstract value” (Peter & Olson, 1993; p. 100). Although the terminology used in this research have been slightly modified for simplification from the traditional means-end theory, for example benefits for consequences and end goals for values, the means-end theory provides the basis for this research. Applying the general means-end chain shown above to the classification developed in the last section and in Table 5.1, we propose a framework of customer value as shown in Figure 5.1. The left half of the framework depicts attribute categories from Table 5.1. The customers’ perceived associations of attributes to the benefits are depicted in the middle, such as: (i) product and service features with functional and economic benefits; (ii) project and service cost with economic benefits; and (iii) supplier attributes and sales staff attributes with psychological benefits.

Figure 5.1: Proposed framework of customer value in organizational buying.



The framework also proposes that in customers' perception functional benefits contribute to economic benefits, economic benefits contribute to psychological-sociological benefits and vice versa. The next part of this framework reflects the key contention of this thesis. We contend that benefits provide the perceived "worth" or "utility" aspect of value to the customers. Thus, we propose that customer's perception of a product's value is a composite of three types of perceived benefits: functional and operational benefits, economic and financial benefits, and social and psychological benefits. These benefits, in turn, facilitate the customers reach their end goals. Hence, a customer values (chooses) those attributes of a product for comparison and selection, which in his/her perception provide maximum benefits toward achieving the end goals. This explains the key question of this research, i.e., understanding what customers value and why in making organizational buying decisions. This also explains the two basic questions of organizational buying process posed in Chapter 1: (1) how are evaluation criteria formed by buying center members? (2) how are individual preferences formed in buying center members?

The framework depicts the determinants of customer's perception of product value. Determinant attributes such as satisfaction with sales person, supplier reputation, appropriateness of price, and desirable product-service features influence the perceived benefits to customers, and perceived benefits to organization. The framework combines the two perspectives of value proposed by Anderson, Janin, and Chintagunta (1993) and Woodruff (1997). The definition of value given by Anderson, Janin, and Chintagunta (1993) talks about value as the perceived worth of benefits as follows. "Value in business markets is the perceived worth in monetary units of the set of economic, technical, service and social benefits received by a customer firm in exchange for the price paid for a product offering, taking into consideration the available alternative suppliers' offerings and prices" (Anderson et al., 1993, p. 5). Using the laddering method, one can not only

determine the benefits that a customer is seeking from the product under considerations, but also what attributes can deliver those benefits to the customer. Woodruff's (1997) perspective of customer value includes the means-end aspects of attributes, consequences, and value as follows. "Customer value is a customer's perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer's goals and purposes in use situations" (p. 142). This research depicts a methodology and operationalization of his idea of customer value. Many applications and implications of this research are described in the following chapter.

Chapter 6

SUMMARY AND CONCLUSIONS

We start this chapter with summary of this dissertation, then discuss potential contributions of this research to business marketing practice and research. The last section is on limitations and future research.

6.1 Summary

There has been a lot of interest among marketing practitioners and researchers in the concept of value perceptions of customers related to a product or service because the ability to create superior customer value is considered to be a prime source of sustainable competitive advantage for businesses (Porter, 1985). Despite the growing interest, there is a dearth in research on customer value as a construct and its role in organizational buying. The purpose of this research was to expand our understanding of what organizational customers value in a product or service and why they value what they do while making buying decisions.

Chapter 1 laid out the relevance of studying what customers value in the field of organizational buying by using Choffray and Lilien (1978) model of organizational buying behavior. The main objectives of the study were:

- (a) To empirically examine customers' value dimensions in organizational buying situation.
- (b) To develop an integrative theory-based framework of customer value in organizational buying using the empirical analysis.

(c) To study differences in customer value profiles for customers in different segments.

There are many connotations of value in various fields as described in Chapter 2. As marketing heavily draws upon theories of different branches of social sciences, this Chapter provides the background and connotations of value across various disciplines such as purchasing and economics, as well as marketing. Five perspectives of value emerging out of the literature were discussed: first, the perspective of human values as end goals; second, supply side or manufacturer's side of value; third, accounting and finance perspective of asset value; fourth, marketer's view point of customer value, and fifth, value concepts related to means-end theory.

This study uses the specific interviewing and data analysis technique called laddering based on means-end analysis (Gutman, 1982; Olson & Reynolds, 1983) which facilitates a deeper understanding of the cognitive processes taking place in organizational buyers related to buying decisions of a piece of telecommunication equipment code named prontom. Total 60 customers of prontom were interviewed in 40 organizations from the names provided by a prontom manufacturer code named Skycorp. Chapter 3 gave details on the methodology and the study. It began by laying out research objectives, followed by description of the pretest study, research design, sample profile, laddering mehtod, and coding. The interview data were coded in specific categories of attributes (A), benefits (B), and end goals (E) as explained by Reynolds and Gutman (1988) to create an implication matrix. Such a matrix shows the number of links among A, B, and E, which Woodruff and Gardial (1996) called customers' value dimensions underlying prontom buying decisions.

Chapter 4 first presented the implication matrix developed for this study and applied it to examine customers' value dimensions in prompt buying decisions. In the next section the attributes, benefits, and end goals derived in this empirical analysis were further analyzed for different loyalty segments, i.e. the customers that were: (a) loyal to Skycorp, (b) switched to Skycorp from a competitor, (c) loyal to a competitor, and (d) switched to a competitor from Skycorp. This chapter also presented the cluster analysis procedure and results.

In Chapter 5, we developed a framework of customer value in organizational buying based on the empirical analysis, means-end theory, and marketing literature. The key purpose behind developing the framework was to explain what customers value, i.e., consider important in making organizational buying decisions, and why.

Value in all its many meanings has become an important concept for the business and academic world. Research is gaining momentum to develop better understanding of the word, and the process of value creation. This research attempted to bring out some of the facets of sources and contents of customer value in organizational buying, and presented a framework of value to help business marketing practitioners and researchers better understand organizational buying process.

6.2 Contributions to Business Marketing Practice and Research

The main contribution of this research to the academia will be the theory building by the conceptual framework of customer value, as this research is a part of the important process of discovery rather than verification (Hunt, 1983). Future research can build upon it to focus on specific tasks of verification. Second major contribution of the study

will be to expand our understanding of customer choice process. Organizational buying literature, (see Ward & Webster, 1991 for a review) highlights the fact that we have to understand the choice process of buying center members to explain and predict their buying behavior. In understanding their choice process, the emphasis has been on attributes such as price, delivery, and quality. To extend this work in choice process beyond attribute level, this study examines how customers associate specific attributes to the benefits they want for achieving certain end goals underlying their needs. This will help researchers and practitioners gain better understanding of customer motivations, i.e., why certain attributes are more salient to a customer and why s/he places more weights on those attributes. They then can incorporate this knowledge in the following specific areas of research and marketing strategy:

Research has demonstrated benefit segmentation to be a very useful way of micro segmentation (Kluyver & Whitlark, 1986; Moriarty & Reibstein, 1986). Although value-based segmentation has been used mainly for consumer products, Forbis and Mehta (1986) and Anderson et al. (1993) have shown that business marketers are interested in identifying segments based on similarity in value perceptions of customers. This research will help market segmentation in two ways: (i) by identifying the benefits customers associate with a product and its attributes, and (ii) by examining the laddering method in organizational buying to do (i).

In addition, the following two applications can use the output of this kind of means-end analysis for future research. The first equation is adapted from Woodruff and Gardial (1996, p. 271). The customers in each loyalty cell can be asked to: (i) rate the importance of each of the attribute and benefit (value dimension) mentioned in Table 3.2

on a 7 point scale from 1 indicating least important to 7 indicating very important, and (ii) asked to rate pronoms from their consideration set on that value dimension on a 7 point scale with indicating poor to 7 indicating very good. Having obtained overall value scores by using the following equation, we can compare customer perceptions for various brands of pronoms.

$$\text{Overall value score} = \frac{\sum_{i=1}^n \sum_{j=1}^m a_{ij} x b_j}{n} \times 10$$

where: $i = i^{\text{th}}$ respondent from survey
 $j = j^{\text{th}}$ value dimension desired by customers
 $n =$ number of respondents
 $m =$ number of value dimensions
 $\alpha =$ value dimension rating
 $\beta =$ importance weight

Second choice of method is conjoint analysis, which is a technique used for several marketing applications (Green & Rao, 1971; Green & Srinivasan, 1978). The following procedure can be used for measuring value of each value dimension.

Stage 1: Identify the attributes and benefits as sources of value using means-end analysis.

Stage 2: Group the individual attributes and benefits into homogeneous categories.

Stage 3: Generate utility scores for the attributes and benefits using conjoint technique.

Stage 4: Use the utility scores to arrive at number representing customer value.

Knowledge of how organizational buyers' value dimensions related to a product will help marketers in better positioning their products in target markets. Using the knowledge of customers' value structures in developing an integrative communication strategy can yield more effective results in terms of positioning and delivering a message

of benefits and value. Focusing the message on the benefits of a product is likely to have more direct appeal as organizational buyers buy benefits rather than a product (Glover et al., 1989). Olson and Reynolds (1983) have developed a model called Means-End Conceptualization of Components for Advertising Strategy (MECCAS) to translate the findings of a laddering study into a specific advertising strategy (see Gutman & Reynolds, 1987 for an application).

Emphasis on value rather than cost as a basis for pricing is growing in business marketing (e.g., Gross, 1978; Wind, 1989; Wilson et al., 1989). This research can help in developing different pricing strategies for different value-based segments. The findings will benefit in better understanding the role of other attributes such as delivery and communication in leading to the same values as that of price, thereby giving more leverage to marketers in shifting the focus of competition from price. . Once marketers understand what customers value, they can then determine what they are willing to pay for what they value using some of the techniques given in Appendix A.

Means-end analysis can prove to be a useful tool to generate ideas for a new or a modified product based on the customer decision maps. Based on this study, a pronom manufacturer may find a set of means-end chains, which may indicate a need for change in the product. Also, marketers can use laddering to shape and pretest a new product concept. Keeney & Lilien (1987) successfully used multiattribute value analysis for designing and evaluating a high tech industrial product.

An increasing number of firms are realizing the importance of combining separate elements of their product lines and augmented product (Kotler, 1986) into bundles. The difficulty in designing bundles is that it should be attractive to buyers and help increase

profit margin or demand for the suppliers. An understanding of where the value of your product and related offerings lies for your customers provides a good basis for developing a bundling strategy. Value addition is a strategy of giving more for same price. Knowledge of value provides an idea as to which additions to the existing product/service will lead to the highest "value added" for the buyers.

In many market research surveys, respondents are asked about the relative value of "our" product versus a reference product, our price versus respondent's reference price, and our quality versus the quality of a reference product's quality. The outcomes of these surveys are used as indicators of value, such as our value rating, quality-price ratio, etc. The focus is on letting the customers tell us what the value dimensions are for them and then asking them to review their perception of our performance on those dimensions.

6.3 Limitations and Future Research

In order to provide a specific context for this study and to bring out maximum variation in value perception regarding one product category, this research focused on the organizational buyers of only one product-prontoms. As a result of this and because of the purposive sampling, the generalizability of findings is limited. Second, despite the care taken during the coding process, another research setting can bring variation in the codes. However, the broad categorization and the proposed framework of customer value developed in the study are applicable for any other product or service category in business marketing. This being the first study of this nature in the area of organizational

buying, this research is a part of theory building process; future research can do the tasks of verification.

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Appendix A

Various value calculation techniques listed by Anderson, Jain, and
Cintagunta (1993)

Value Analysis Techniques (Anderson, Jain, and Chintagunta, 1993)

1. “Internal Engineering Assessment: An estimate of the value for a product offering is obtained by laboratory tests conducted by engineers within the supplier’s own firm. (p. 7)”.
2. “Field value-in-use assessment: Interviews are conducted at customer firm(s) to determine a comprehensive listing of cost elements associated with the usage of a product offering compared with the incumbent product offering (e.g. life cycle cost). Making explicit assumptions, values are assigned to these cost elements to estimate the overall value-in-use of the product offering in that application in cents per pound or dollars per unit. (p. 7)”.
3. “Indirect survey questions: In a field research study, respondents are asked what the effects of one or more changes in the present product offering would be on certain aspects of their firm’s operations. From these answers, typically combined in some way with other known information, estimates of the value or worth of each product offering change can be obtained. (p. 8)”.
4. “Focus group value assessment: Within a focus group setting, participants are exposed to potential product offerings or product concepts, and are then asked what the value or worth of them would be to their firms: ‘What would your boss be willing to pay for this?’ (p. 8)”

5. “Direct survey questions: In a field research survey, respondents are given a description of a potential product offering or concept, and are then asked what the value of worth of it would be to their firms: ‘what would your firm be willing to pay for this?’ (p. 8)”

6. “Conjoint or Tradeoff analysis: In a field research survey, respondents are asked to evaluate a set of potential product offerings in terms of their firm’s purchase preference for each of the offerings. Each offering consists of an array of attributes or features, and the levels of these attributes are systematically varied within the set of offerings. Respondents provide a purchase preference rating (or ranking) for the offerings. Statistical analysis is then used to “decompose” these ratings into value (“part-worth”) that the respondent placed on each level of each attribute. The range of these values for the levels of each attribute determines the relative value of attributes themselves. (p. 9)”.

7. “Benchmarks: In a field research survey, respondents are given a description of a product offering, typically representing the present industry standard, that serves as a “benchmark” offering. They are then asked how much more their firm would be willing to pay for the selected additions in product attributes or features to this “benchmark” offering. Likewise, they might be asked how much less their firm would expect to pay for selected reductions in attributes or features from the “benchamrk” offering. (p. 9-10)”.

8. “Compositional approach: In a field research survey, respondents are asked to directly give the value of selected levels of attributes or features to their firm. For example, respondents might be asked to give the value in cents per pound or dollars per unit for each of the alternate levels of a given attribute, where all other attributes of the product offering were the same. The values given for the attribute levels can then be added to give estimates of the overall value of various offerings to the firm. (p. 10)”.

9. “Importance ratings: In a field research survey, respondents are given a set of attributes or features of a product offerings and are then asked to rate (or rank) them on importance to their firm. For the attributes or features that were rated, respondents are also asked to rate (or rank) the supplier firms with respect to their performance on them, thereby providing a competitor analysis of the value provided by each supplier’s product offering. (p. 11)”.

Appendix B
Consent letter.

Consent Form

This is to certify that I, _____, hereby agree to participate in this study of organizational buying behavior as an authorized part of the education and research program of The Pennsylvania State University under the supervision of Prof. David T. Wilson.

The study and my part in the study have been defined and fully explained to me by Swati Jantrania, and I understand her explanation.

I have been given an opportunity to ask whatever questions I may have had and all such questions and inquiries have been answered to my satisfaction.

I understand that I am free to deny any answers to specific items or questions in the interview.

I understand that any data or answers to questions will remain confidential with regard to my identity.

I understand that, in the event of injury resulting from this investigation, neither financial compensation nor, free medical treatment is provided for such an injury, and that further information on this policy is available from the Office of the Senior Vice President for Research and Dean of the Graduate School, 114, Kern Graduate Building (814-865-1775).

I FURTHER UNDERSTAND THAT I AM FREE TO WITHDRAW MY CONSENT AND TERMINATE MY PARTICIPATION AT ANY TIME.

Date

Subject's Signature

I, the undersigned, have defined and fully explained the study to the above subject.

Date

Investigator's Signature

Appendix C

Complete questionnaire.

I. Demographic information

Name of the respondent:

Title:

Name of the organization:

Address:

Telephone number:

Classification:

System purchased:

Supplier:

Date purchased:

II. General information**a. Buying process:**

Who was involved:

Name:

Title:

Name:

Title:

Name:

Title:

Time span:

Reason for purchase:

Suppliers considered (reasons):

Service contract:

b. Buying influencers:

c. Respondent's role in the buying process

d. Buying/selection criteria in general (any forms, etc.)

e. Past buying (brand selection/changes):

Brand:

Model:

Date bought:

Reason for new system:

f. Future buying (brand selection/changes)

Laddering questionnaire

Think about the situation when you were involved in making a decision about buying a pronom system for your organization. What aspects or attributes did you consider while making the purchase decision for a pronom system?

- | | |
|----|----|
| 1. | 4. |
| 2. | 5. |
| 3. | 6. |

For each of the aspects/attributes that you listed above, I would like to know why it is important.

(A) Consider the first aspect/attribute you mentioned above:

(i) Please describe in detail what you mean by this aspect/attribute:

(ii) Why is this characteristic important?

(iii) Why is what you described in (ii) important?

(iv) Why is what you described in (iii) important?

(v) Why is what you described in (iv) important?

(B) Consider the 2nd aspect/attribute you mentioned above:

(i) Please describe in detail what you mean by this aspect/attribute:

(ii) Why is this characteristic important?

(iii) Why is what you described in (ii) important?

(iv) Why is what you described in (iii) important?

(v) Why is what you described in (iv) important?

(C) Consider the 3rd aspect/attribute you mentioned above:

(i) Please describe in detail what you mean by this aspect/attribute:

(ii) Why is this characteristic important?

(iii) Why is what you described in (ii) important?

(iv) Why is what you described in (iii) important?

(v) Why is what you described in (iv) important?

(D) Consider the 4th aspect/attribute you mentioned above:

(i) Please describe in detail what you mean by this aspect/attribute:

(ii) Why is this characteristic important?

(iii) Why is what you described in (ii) important?

(iv) Why is what you described in (iii) important?

(v) Why is what you described in (iv) important?

(E) Consider the 5th aspect/attribute you mentioned above:

(i) Please describe in detail what you mean by this aspect/attribute:

(ii) Why is this characteristic important?

(iii) Why is what you described in (ii) important?

(iv) Why is what you described in (iii) important?

(v) Why is what you described in (iv) important?

Appendix D

Computer output for cluster analysis

Cluster analysis: Results from SAS PROC FASTCLUS

Cluster Means

Cluster	vmail	expand	pcost	scost	pastp	remot
1	0.000000000	0.020000000	0.000000000	0.020000000	0.060000000	0.020000000
2	0.000000000	0.033333333	0.000000000	0.000000000	0.100000000	0.000000000
3	0.0357142857	0.000000000	0.000000000	0.000000000	0.0357142857	0.0357142857
4	0.000000000	0.2345679012	0.0987654321	0.0617283951	0.0493827160	0.0617283951
5	0.0131578947	0.000000000	0.3026315789	0.1184210526	0.0131578947	0.1578947368
6	0.800000000	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000

Cluster Means

Cluster	review	tech	staffexp	userf	speed	capacity
1	0.120000000	0.040000000	0.180000000	0.080000000	0.000000000	0.000000000
2	0.000000000	0.100000000	0.000000000	0.200000000	0.233333333	0.066666667
3	0.000000000	0.1428571429	0.1428571429	0.250000000	0.000000000	0.000000000
4	0.0370370370	0.1234567901	0.0123456790	0.0123456790	0.0493827160	0.0246913580
5	0.000000000	0.000000000	0.0394736842	0.0394736842	0.0263157895	0.0526315789
6	0.000000000	0.080000000	0.000000000	0.080000000	0.000000000	0.000000000

Cluster Means

Cluster	ucd	reput	delv	servf	infras	reliab
1	0.020000000	0.040000000	0.040000000	0.140000000	0.060000000	0.080000000
2	0.033333333	0.033333333	0.100000000	0.066666667	0.000000000	0.100000000
3	0.1428571429	0.0714285714	0.000000000	0.1071428571	0.000000000	0.0357142857
4	0.000000000	0.0493827160	0.0370370370	0.0493827160	0.0493827160	0.0617283951
5	0.0263157895	0.0263157895	0.0526315789	0.0131578947	0.1052631579	0.0263157895
6	0.000000000	0.000000000	0.000000000	0.040000000	0.000000000	0.000000000

Cluster Means

Cluster	quality	staffaval	fasttrans	time	equal
1	0.040000000	0.100000000	0.000000000	0.060000000	0.000000000
2	0.066666667	0.000000000	0.166666667	0.066666667	0.033333333
3	0.000000000	0.0357142857	0.000000000	0.0357142857	0.1071428571
4	0.0493827160	0.0246913580	0.0493827160	0.0370370370	0.000000000
5	0.000000000	0.000000000	0.0263157895	0.0394736842	0.0131578947
6	0.000000000	0.000000000	0.000000000	0.000000000	0.040000000

Cluster Means

Cluster	wresource	lessrisk	productivity	lessdowntime	solvesprob	futureneeds
1	0.020000000	0.400000000	0.040000000	0.040000000	0.040000000	0.020000000
2	0.000000000	0.000000000	0.033333333	0.066666667	0.100000000	0.000000000
3	0.000000000	0.1071428571	0.0714285714	0.0357142857	0.2142857143	0.0357142857
4	0.0987654321	0.0617283951	0.0493827160	0.0740740741	0.0370370370	0.3456790123
5	0.2236842105	0.000000000	0.1315789474	0.1184210526	0.0263157895	0.000000000
6	0.000000000	0.000000000	0.240000000	0.000000000	0.000000000	0.000000000

Cluster	avoids	workenv	communication	credibility	jobperform
---------	--------	---------	---------------	-------------	------------

1	0.000000000	0.020000000	0.020000000	0.280000000	0.100000000
2	0.000000000	0.033333333	0.166666667	0.033333333	0.333333333
3	0.000000000	0.3571428571	0.0357142857	0.0357142857	0.000000000
4	0.0617283951	0.000000000	0.0123456790	0.0740740741	0.0123456790
5	0.000000000	0.0131578947	0.0789473684	0.000000000	0.000000000
6	0.000000000	0.000000000	0.000000000	0.000000000	0.080000000

Cluster Means

Cluster jobsecurity	survival	compadvantage	fhealth	jobsatis	missionach
1	0.000000000	0.000000000	0.000000000	0.000000000	0.020000000
2	0.200000000	0.166666667	0.000000000	0.033333333	0.066666667
3	0.000000000	0.000000000	0.000000000	0.964285714	0.000000000
4	0.938271604	0.000000000	0.000000000	0.000000000	0.037037037
5	0.000000000	0.157894736	0.789473684	0.000000000	0.039473684
6	0.120000000	0.240000000	0.040000000	0.000000000	0.240000000

Cluster Means

Cluster	cs
1	0.000000000
2	0.433333333
3	0.000000000
4	0.000000000
5	0.000000000
6	0.280000000

Cluster Standard Deviations

Cluster	vmail	expand	pcost	scost	pastp	remot
1	0.000000000	0.141421356	0.000000000	0.141421356	0.239897937	0.141421356
2	0.000000000	0.182574185	0.000000000	0.000000000	0.305128576	0.000000000
3	0.188982236	0.000000000	0.000000000	0.000000000	0.188982236	0.188982236
4	0.000000000	0.426368530	0.300205690	0.242161052	0.218015743	0.242161052
5	0.114707866	0.000000000	0.462449617	0.325252938	0.114707866	0.367065174
6	0.408248295	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000

Cluster Standard Deviations

Cluster	review	tech	staffexp	userf	speed	capacity
1	0.328260727	0.197948663	0.388087934	0.274047515	0.000000000	0.000000000
2	0.000000000	0.305128576	0.000000000	0.406838102	0.430183067	0.253708131
3	0.000000000	0.356348322	0.356348322	0.440958551	0.000000000	0.000000000
4	0.190029237	0.331010424	0.111111111	0.111111111	0.218015743	0.156149659
5	0.000000000	0.000000000	0.196012888	0.196012888	0.161136315	0.224780594

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The FASTCLUS Procedure

Replace=FULL Radius=0 Maxclusters=6 Maxiter=1

Cluster Standard Deviations

Cluster	review	tech	staffexp	userf	speed	capacity
6	0.000000000	0.276887462	0.000000000	0.276887462	0.000000000	0.000000000

Cluster Standard Deviations

Cluster	ucd	reput	delv	servf	infras	reliab
1	0.141421356	0.197948663	0.197948663	0.350509832	0.239897937	0.274047515
2	0.182574185	0.182574185	0.305128576	0.253708131	0.000000000	0.305128576
3	0.356348322	0.262265264	0.000000000	0.314970394	0.000000000	0.188982236
4	0.000000000	0.218015743	0.190029237	0.218015743	0.218015743	0.242161052
5	0.161136315	0.161136315	0.224780594	0.114707866	0.308931378	0.161136315
6	0.000000000	0.000000000	0.000000000	0.200000000	0.000000000	0.000000000

Cluster Standard Deviations

Cluster nomissedcalls	quality	staffaval	fasttrans	time	equal
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ffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffffff
1      0. 1979486637  0. 3030457634  0. 0000000000  0. 2398979375  0. 0000000000
0. 0000000000
2      0. 2537081317  0. 0000000000  0. 3790490218  0. 2537081317  0. 1825741858
0. 0000000000
3      0. 0000000000  0. 1889822365  0. 0000000000  0. 1889822365  0. 3149703942
0. 0000000000
4      0. 2180157430  0. 1561496591  0. 2180157430  0. 1900292375  0. 0000000000
0. 0000000000
5      0. 0000000000  0. 0000000000  0. 1611363158  0. 1960128889  0. 1147078669
0. 0000000000
6      0. 0000000000  0. 0000000000  0. 0000000000  0. 0000000000  0. 2000000000
0. 4358898944

```

Cluster Standard Deviations

Cluster	wresource	lessrisk	productivity	lessdowntime	solvesprob	futureneeds
1	0. 1414213562	0. 4948716593	0. 1979486637	0. 1979486637	0. 1979486637	0. 1414213562
2	0. 0000000000	0. 0000000000	0. 1825741858	0. 2537081317	0. 3051285766	0. 0000000000
3	0. 0000000000	0. 3149703942	0. 2622652642	0. 1889822365	0. 4178554470	0. 1889822365
4	0. 3002056908	0. 2421610524	0. 2180157430	0. 2635231383	0. 1900292375	0. 4785523437
5	0. 4194817186	0. 0000000000	0. 3402785237	0. 3252529380	0. 1611363158	0. 0000000000
6	0. 0000000000	0. 0000000000	0. 4358898944	0. 0000000000	0. 0000000000	0. 0000000000

Cluster Standard Deviations

Cluster	avoidobs	workenv	communication	credibility	jobperform	savesmoney
1	0. 0000000000	0. 1414213562	0. 1414213562	0. 4535573676	0. 3030457634	0. 0000000000
2	0. 0000000000	0. 1825741858	0. 3790490218	0. 1825741858	0. 4794633015	0. 0000000000
3	0. 0000000000	0. 4879500365	0. 1889822365	0. 1889822365	0. 0000000000	0. 0000000000
4	0. 2421610524	0. 0000000000	0. 1111111111	0. 2635231383	0. 1111111111	0. 3002056908
5	0. 0000000000	0. 1147078669	0. 2714483570	0. 0000000000	0. 0000000000	0. 4729526515
6	0. 0000000000	0. 0000000000	0. 0000000000	0. 0000000000	0. 2768874621	0. 0000000000

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The FASTCLUS Procedure
 Replace=FULL Radius=0 Maxclusters=6 Maxiter=1

Cluster Standard Deviations

Cluster	survival	compadvantage	fhealth	jobsatis	missionach	jobsecurity
1	0. 0000000000	0. 0000000000	0. 0000000000	0. 0000000000	0. 1414213562	0. 3030457634
2	0. 4068381022	0. 3790490218	0. 0000000000	0. 1825741858	0. 2537081317	0. 0000000000
3	0. 0000000000	0. 0000000000	0. 0000000000	0. 1889822365	0. 0000000000	0. 0000000000
4	0. 2421610524	0. 0000000000	0. 0000000000	0. 0000000000	0. 1900292375	0. 0000000000
5	0. 0000000000	0. 3670651742	0. 4103913408	0. 0000000000	0. 1960128889	0. 0000000000
6	0. 3316624790	0. 4358898944	0. 2000000000	0. 0000000000	0. 4358898944	0. 2000000000

Cluster Standard Deviations

Cluster	cs
1	0. 0000000000
2	0. 5040069330
3	0. 0000000000
4	0. 0000000000
5	0. 0000000000
6	0. 4582575695

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PUBLICATIONS/PRESENTATIONS

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