2 LITERATURE REVIEW

2.1 CAD/CAM Purchase as Industrial Buying

The study deals with Purchase Decisions of CAD/CAM products. This leads to Industrial buying behaviour. CAD/CAM products are purchased by engineering industries to design, analyse, and manufacture their products more effectively. Typically concept of ‘Art to Part’ is taken care of by CAD/CAM products. As an art is imaginative, design is also an imagination of an Engineer. This art is then converted to concept designs, and then to detail designs (CAD). These designs are then tested for their working conditions (CAE) and then converted to actual parts by sending commands to CNC machines (CAM). An individual as a consumer will rarely buy these software products. Individual buyers will be buying these products as an independent engineering consultant, or an engineering researcher. But the volume of investment will prohibit an individual from doing so, unless and otherwise the research or consultation job yields sufficient benefits. Thus the CAD/CAM purchase is an industrial purchase phenomenon, involving industrial buying behaviour to be reviewed from literature available.

We will discuss various theories of the buying behaviour. Industrial buying behaviour as against consumer buying behaviour is a process. We do not see any impulsive buying in an organization. The process involves different persons, or teams performing different function for the purchase. As these software products are highly priced they need capital expenditure budgets to purchase them. We will study theories related to industrial buying behaviour in the following sections of this chapter.

The analysis is done in the form of attributes of the CAD/CAM products that affect the Purchase Decision. This calls for understanding the CAD/CAM products’ attributes and
their analysis. There are many product attributes that affect the Purchase Decision. Product’s technical capabilities, an organization’s channel infrastructure and support system, product pricing and other commercial terms, and data compatibility related issues of the CAD/CAM products contribute to the list of attributes that clearly affect the Purchase Decision of CAD/CAM products.

Attributes can be many, but some can function in a similar manner. They can be clubbed together to form a common-factor attribute. These attributes finally affect the Purchase Decision. Attributes may or may not be dependent upon one another. Thus the attributes need to be studied for their interdependence. To find the impact of these attributes (independent variables) on the Purchase Decision (dependent variable), equation will be constructed out of the observations carried out in the study. Literature for interdependence of attributes and related analysis will be included in the study.

### 2.2 Related Literature & Theoretical Background

The industrial buying relates to Industrial Market. This market is very vast market that consists of all individual and organizations that buy products & services to serve any of the following:

- To manufacture other products or create other services: for instance, Tata Motors buys tires, forged crankshafts etc to manufacture a car and Tata Motors buys concept design services to design a car,
- To aid the manufacture or transact the business operations: for instance, a company buys stationery, telephone service to communicate with vendors, customers, &/or
- To perform the supply chain operations: for instance, a distributor buys from a manufacturer to sell to a dealer who sells to a retailer.

Thus any product or service purchased for other than individual or household consumption becomes a part of Industrial Market.
Industtrial market is now-a-days is termed as business market to cover manufacturing as well as non-manufacturing markets. It consists of 6 major markets such as agriculture, government, reseller, services, international & non-profit markets.

Industrial market is characterized by following:

- As described earlier this market consists of purchase of products & services to generate other products or services or other in-house consumption or for distribution
- Impulsive buying almost absent is industrial market, as the decisions are based on rational, logical thinking and on economic factors
- Demand in industrial market is not direct, but it is derived demand
- The number of business buyers is relatively small, but the purchase volume and value is very large in comparison to that in consumer market
- Technical specifications, service aspects & performances are very important in the decision making process
- Direct marketing, personal selling and partnership/relationship marketing play a very important role
- Sales promotion, attractive packaging and price do not play major role in purchase
- Delivery commitment and conforming to specifications of product are very critical in retaining the customer
- Business buyers are geographically concentrated and are well informed
- Vendor loyalty and reciprocity (buy & sell both) is very high
- Line extension (added product promotion) will require clear economic benefits
- Specific media like trade show, trade journals are important for sales promotion
- The number of factors that influence the Purchase Decision is relatively large making it a very complex and formal buying process

2.2.1 Nature of Industrial/ Organizational Buying

“Organizational buying is similar to consumer buying since it is not ‘organizations’ making the buying decisions but people within those organizations. But there are
significant differences that must be understood by marketers in order to succeed in the organizational market.” (Loudon & Della Bitta, 2002)

2.2.1.1 Purpose of Industrial Buying:

Like the consumers, industrial buyers also make Purchase Decisions in order to satisfy their goals. But the goals are different. Consumers’ goals are to satisfy a need or a want. Industrial buyers’ goals are to create other products or provide services or resell a product. The goals for industrial buyers are to buy the products or services to effectively manage their business activities stated above. Organizational buyers may be for profit or not-for-profit; product or service oriented; governmental or private. In all the cases organizational buying takes place in order to produce a product, provide a service or engage in resale.

Organizational buying has evolved over decades. Earlier simply a clerk used to handle purchase, but today a purchase team of purchasing specialists perform the task. In the current complicated environment the purchasing specialists attempt to satisfy the organization’s product or service needs in a complex process. He/she has to keep balancing of relations with suppliers, colleagues, and superiors, product specifications, trade regulations, personal reputation, price and other factors.

2.2.1.2 Market Structure and Demand

There are several factors related to the market structure and demand that a marketer has to understand. They are discussed in following paragraphs.

- **Geographical Concentration**: buyers are more concentrated in one area than in the consumer market. For instance most of the industrial buyers are located in Pune, Mumbai, Nashik, Aurangabad, & Nagpur area than the entire state of Maharashtra in India. If we consider only automobile manufacturing industries are concentrated near Pune while chemical industries are near Mumbai.

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• **Fewer Buyers Large Volume:** buyers are very few in organizational markets compared to that in consumer markets. For instance a tire manufacturer has to deal with original equipment manufacturers like auto, truck, tractor, 2-wheeler manufacturers, and supply them bulk quantities. The consumer market consists of all the consumers spread across the nation and consume tires in small numbers.

• **Vertical and Horizontal Markets:** in a vertical market products are sold to all the organizations from one or two industries. For instance bigger drill bits are sold to Oil exploring industry. Any fluctuation in demand may hit hard to that supplier. Horizontal market covers across the industries. For instance, a computer may be purchased by all possible industries to maintain the accounts.

• **Derived Demand:** Organizational demand is mainly derived from the consumer demand. Any Air Conditioner manufacturer (say Voltas) procures products & services to cater to the demand for Air Conditioners from consumers. Any decrease in the demand for AC will adversely affect the business of Voltas and its dealers. So they have to maintain good advertising campaign to retain their market share in case of adverse demand conditions.

• **Inelastic Demand:** total industrial demand for industrial products is not affected by the changes in the prices in short run as compared to the consumer market demand. A small increase in price of a tire will not reduce the demand for the tires from an automobile manufacturer. But if a single supplier increases the price, individually that company may find reduction in the demand as better alternatives are available.

• **Fluctuating Demand:** organizational buying is closely related to the economic cycle. When consumer demand is up, industrial demand is also up in many folds and organizations will build large inventories of raw material and bought-out components to keep steady supplies for production and further sale. When economy slows down organizations will stop further purchases and consume the inventories for required production. Thus fluctuations in organizational markets are bigger than the consumer one.
2.2.1.3 Buyer Characteristics

There are several buyer characteristics of industrial buyer that differentiate from that of the consumer ones as described in following paragraphs.

**Group Involvement**: products purchased by organizations are costly and complex, a group of individuals is involved in the Purchase Decision. Persons from engineering, finance, production, purchasing and top management will participate depending upon the complexity and cost of the product purchased.

**Technical Knowledge**: professional buyers are normally involved in the organizational buying who are knowledgeable in the respective areas of purchase. These competent individuals are called as purchasing agents in industrial, governmental, institutional organizations. In resellers such as discount houses, these people are called buyers and are responsible for purchasing the line of merchandise to be resold.

**Rational Motivation**: organizational buyers are strongly directed by the rational motivation. These factors are generally economically based and can be transferred into Rupee terms so that benefits can be quantified. For instance product quality, consistency, prompt delivery assurances, price, credit terms, warranty, and service are objective elements that influence the buyer’s decision. In addition to rational motivation, buyers are also influenced by emotional motivations which are very difficult to assess. For instance, buyers being human beings will have their likes & dislikes for vendor sales person, concern for their own job security, need to be respected in their job, willingness to take risks etc. A buyer, who enjoys being entertained, may direct a greater share of purchases to a supplier who with an equal product, ‘treat the buyer better.’ More rational basis is adopted by buyers to redefine their supplier relationship as follows:

- Reducing the supplier base to a few key suppliers of a product or service
- Procurement based on a long term cost per unit not simply price per unit as a way of recognizing quality and service differences and costs.
- Thorough analysis of supplier companies, using teams with members from various functions within the purchasing company.
• Supplier ‘partnering’, such as early involvement in new product development projects. (Atkins, August 1989)

Handling objections and closing the sales will need presenting solution to the customers’ problem in today’s business environment. Focus has to be on understanding the customer needs and meting them, not just getting a sale. Selling to a new breed of purchasers may involve:

• Educating sales people more thoroughly on all aspects of company products in order for them to function on customer problem-solving teams.
• Using in-depth selling to relate to everyone in the customer’s organization.
• Practicing patience in case another supplier already has the contract- the sales person can build toward the next contract award. (Atkins, August 1989)

2.2.1.4 Decision Process and Purchase Patterns

Organizational buying patterns are characterized by a number of differences from final consumers in their decision process and purchase patterns.

**Formality:** several organizational buyer behaviors are typified by greater formality than that in final consumers. The proposals, quotations, and purchase contracts are the documents that inculcate formality in organizational buying. Organizational buyers have led down elaborate procedures and policies for purchasing.

**Complexity:** formality becomes necessary in the organizational buying because of the complexity involved in the organizational buying. Organizational buying involves more technical complexity and financial risks that that in consumer buying.

**Lengthy Negotiations:** organizational buying involves more lengthy & extensive discussions or negotiations than that needed in consumer buying. The reasons for the lengthy negotiations are:

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- Size of the order is large and the purchase price is very important
- A large number of people are involved in the decision
- The product or service procured is complex and specifications must be carefully agreed to.

**Multiple Suppliers:** organizational buyers keep multiple suppliers for a product or a service so that unforeseen circumstances such as strike, earthquake, floods etc can be overcome. Company policies may not allow a single vendor to supply more than a certain percentage of company’s requirements. Instead buyers source the same product from two or more suppliers in order to be assured a steady supply of the product. This competition between vendors also can be a healthy lever for buyers to use in obtaining attractive terms and effective service from supplier.

**Large Orders:** the typical organizational purchase is much larger than that in consumer purchase. Distributors buy from the equipment manufacturer a huge quantity. Reseller buys from the distributor in large quantities, break into smaller lots and sell to other organizational buyers or final consumers.

**Infrequent Purchase:** very large scale and costly products would be infrequently purchased by organizations. Even less expensive products are bought through yearly contracts reducing the frequency of purchase. In such cases the order once placed will dictate staggered deliveries over a period of one year or so. The organizational marketer therefore has to be vigilant about selling opportunities because they may arise only infrequently.

**Direct Buying:** buying directly from manufacturer is very common in organizational buying, which is growing in the consumer market also. This direct buying pattern is long established because of order size, product complexity and bulk, technical assistance prior to and after the sale, and geographic proximity of the customer. Direct relationship between producers and buyers has been widely adopted for many organizational purchasing situations.
**Reciprocity**: reciprocity happens when two organizations agree to purchase from each other, and is more frequently in industries where products are homogeneous with little price sensitivity. Chemicals, paints, steel, rubber, and paper industries have exhibited a history of reciprocity. For instance, an auto company may buy steel from one supplier and that supplier buys trucks from the automotive company. The restrictive trade practices laws in various countries (like MRTP in India) have put obstacles in reciprocity practices. Still some companies follow this practice informally and innocently, provided it is justifiable on the basis of gaining a competitive quality product, price, delivery, terms and service from supplier; otherwise it makes a poor economic sense and is a source of frustration of professional buyers.

**Importance of Service**: organizational buyers require service because it has such a direct bearing on their costs, sales and profits, as compared to consumer buyers. Companies known for their exceptional service tend to be the ones who excel in an industry. This is more important for the companies who are unable to stand out in the markets with homogeneous products and prices. Buyers can be effectively marketed to with an edge in such service areas as on-time delivery, credit, repair, market information and inventory maintenance.

### 2.2.2 Influences on Organizational Buyer Behavior

There are four categories of factors that influence organizational buyer behavior: environmental, organizational, inter personal and individual. (Webster & Wind, Winter/Spring 1996)\(^\text{7}\). The original article was published in the Journal of Marketing magazine in April 1972 by the same authors. Understating these factors is critical for marketers in preparing effective marketing strategy.

The industrial marketer could find a model of buyer behavior useful in identifying the key factors influencing response to marketing effort. It can help the marketer analyze available information about the market and identify the need for additional information. **The Fig. 2.1** shows how these influencers affect the buying decision in an organization.

Figure 2.1 Influencing Factors on Purchase decision

I. The environment (environmental determinants of buying behavior)
- Physical env.
- Technological env.
- Economic Env.
- Political env.
- Legal env.
- Cultural env.
- Suppliers
- Customers
- Government
- Labor
- Trade unions
- Associations
- Professional Group
- General business Conditions
- Other Business Firms
- Other Social Inst.

II. The Organization (Organizational determinants of buying behavior)
- Organizational climate: physical, technological, economic, cultural
  - Technology relevant
  - For purchasing
  - Technological constraints & technology available to the organization
- Organizational structure
- Organizational goals & tasks
- Organizational actors
- Technology relevant
- For purchasing
- Organizational structure
- Group tasks
- Buying center
- Members of the buying center
- Member characteristics & goals, leadership

III. The Buying Center (interpersonal determinants of buying behavior)
- Task
- Activities
- Interactions
- Sentiments
- Non-Task
- Activities
- Interactions
- Sentiments

IV. The Individual Participants
- Motivation, cognitive structure, personality, learning, process, perceived roles

2.2.2.1 The Environmental Factors

There are seven environmental factors affecting Organizational Buyer behavior as discussed bellow.

Physical: the physical environment includes factors such as climate and geographical location of the organization. These factors can influence the behavior of organizational members and determine the constraints and options for the buying organization. A supplier’s geographical location is an important consideration whether it is chosen or not. Many companies prefer local suppliers and in international sphere, many buyers prefer domestic supplier wherever possible. Climate and geography also determine the availability of the raw materials from forests, farms, mines for the organization as well as its location decision based on raw material, labor availability, and transportation system.

Technological: the level of technological development defines what types of products and services are available to the organizational buyer. In addition it influences the quality of the buying process itself through development of improved purchasing technology using more sophisticated equipment such as computers to facilitate complex purchasing and inventory control decisions.

Economic: the economic environment for the buying organization is affected by price and wage conditions, money and credit availability, consumer demand, the availability of goods and services, ability of buyers to finance purchases, and what prices will be paid. Just as for final consumers, the economic environment will influence organizational buyers’ optimism and consequently their buying behavior.

Political: political influence could include factors such as country trade agreements, tariffs barriers, lobbying activities, defense spending, government assistance to certain industries or companies and government attitude towards business generally.
**Legal**: local, state and federal legal and regulatory environments have an influence on buying activities which take place. Government regulation sets standards for what must be bought in order to be included on products (e.g. auto and lawnmower safety equipment). Terms of sale and conditions of competition are also enforced by legal means on organizational buyers.

**Ethical**: the ethical environment is of major importance in the buyer-salesperson relationship (though not covered in the model). Buyers and salesperson must exhibit behavior if they are to be accepted as professionals. Consequently each group needs to know what is considered to be ethical and unethical behavior. There are some authorities in various countries (like in the US-The National Association of Purchasing Management) that have developed code of ethics to be followed by the professional buyers. Little research has been conducted on how purchasing agents view the ethics of particular salesperson behavior. However when selling activities are perceived as unethical by purchasers, they may negatively affect choice of supplier as well as hurt the purchaser’s career.

**Cultural**: culture establishes values that are shared by members and which influence them in their buying behavior. Large organizations too have developed their own corporate culture which differs in its values, norms, habits, traditions, and customs. The nature of these differing values, styles and behaviors may be evident in the organization’s buying behavior. For example, companies like AT&T, 3M or HP which emphasize technological expertise, would look for this quality in their suppliers.

These environmental influences may be exerted through a number of different types of organizations including business firms (suppliers, customers, and competitors), government, labor unions, trade and professional organizations and other social institutions such as religious and educational organizations. These institutions exert their influences on buying decisions of organizations. First, they determine the availability of goods and services to the organizational buyer. Second, they define the general business conditions in which the firm operates. Third, they define the values and norms guiding buying actions.
2.2.2.2 Organizational Factors

Organizational buying takes place in very formal way in an organization, so organizational objectives, policies, procedures, structure, and system of rewards, authority, status & communication play influential role on the decision making process. The marketer has to understand the following aspects of organizational buying process in order to design the effective marketing strategy to influence the decision process. These aspects are discussed in the following paragraphs.

Tasks: buying task is been performed by the organization to fulfill its objective of the purchase. There are different types of classifications of tasks such as level of expenditure, what is the purpose, type of goods or services purchased, whether its routine purchase or a new one, whether it is a decentralized or centralized purchase etc. the way buying tasks are performed and decisions are taken reflect the type of organization doing the buying.

Structure: Organizations have buying structures. They are formal and informal buying structures. Formal structure is depicted by the hierarchical structure of that organization. Informal structure may be different from formal one. One has to clearly understand both the buying structures so as to make an effective sale in that organization. There are several aspects of this structure that influence the buying behavior.

The degree of centralization in an organization is a very significant factor. This means that the decisions will be in the control of very few persons who are highly placed in that organization. When the authority is concentrated in this manner, a marketer has to be in touch with only a few persons who influence or take the decisions. There can be obstacles to reach to these highly placed persons or even the communication frequency also may be very less.

Formalization in an organization is another factor that is important for the buying behavior. A formal organization has laid down the policies, and procedures for making a Purchase Decision which are strictly followed. This formalization leads to more persons participating in the process of decision making. Decision process is very much structured and it follows the laid down general instructions for the decision making. A
marketer finds difficulty in the formalized organizations in the area where some changes are required to be incorporated. The structure may resist the change due to the inertia exerted by the procedural system.

Specialization in an organization is the third aspect that influences the buying decision. Specialization in an organization leads to various departments as per the functional specialization. In this situation more number of persons is involved in the buying structure that influences the buying decision. A marketer has to understand which person or persons need to be handled or convinced on parameters of the purchase for a favorable buying decision.

**Technology:** technology in the organization influences not only what needs to be purchased but the purchase procedure also. Let us take an example of an organization that has implemented technological solutions like inventory control, price forecasting, purchase scheduling charts, optimum order quantities etc. In each of these technology solutions, there is some scientific method or procedure and assumptions which influence the decision process and the decision itself. Most of these systems are computerized one. Thus the results out of these systems are impersonal and method oriented that influence the Purchase Decisions. Various inventory techniques even decide when to buy raw material or bought-out components, based on re-order levels in the inventories.

**People:** persons are the most important factors that influence the Purchase Decisions in an organization. These persons are interdependent and influence each other during the Purchase Decision making process. Finally these persons’ behavior is termed as the organizational buying behavior. A marketer has to understand these persons from their authority, responsibility positions and adapt proper strategy to convince them towards making a favorable decision in his/her favor. He/ she has to understand the interactions between these people also.

**2.2.2.3 Interpersonal Factors (The Buying Center)**

Organizational buying decisions are influenced by the interaction between two or more persons. Interaction is needed for people to provide information to each other and as an
outcome of this interaction they influence each others’ views about the Purchase Decision so that the outcome benefits them. This group of people in an organization making the Purchase Decision is termed as **buying center**. The influence of one person on another person is termed as interpersonal influence which occurs commonly in a buying center.

**Buying Center**: The buying center is a subset of the organizational actors, those who interact during the purchase of a product or a service. The size of the buying center may vary depending upon:

- How much the Purchase Decision is novel, complex and important
- How the organization is formed: centralized, formalized, & specialized.

Most of the organizations will have more than one person making the Purchase Decisions after interacting with each other. Having one person making the decision is a remote possibility in organization. The interaction within the buying center is with the help of horizontal and vertical communication and involvement. For example purchase of a CAD product in an organization will likely involve following persons in buying center: Vice President- Design, Manager- Design, Vice President- IT Services, Engineer, and Vice President-Purchase. Here the marketer has to understand who is participating in the decision, and what their functions, degree of authority and interests are in the process of this particular decision. As shown in the **Table 2.1**, the buying center participants’ involvement may vary with respect to the stages of decision making process.

Buying center concept is a widely used concept in the study of Purchase Decision of an organization. Research studies use buying center as a basic unit of analysis while studying a particular Purchase Decision. This involves members in the buying center, their interaction in terms of communication, & their influences that actually drive the final decision. However some criticize this approach being an approach of group which may not be appropriate.

The other concept is **buying system**, which examines the streams of behavior that characterizes ongoing buying activities in the organization. Thus buyer system is the
basis unit of analysis in this study that evaluates the stream of behavior that characterizes ongoing buying activities in the organization. This involves organizational members from diverse functional areas representing diverse level of hierarchy who

**Table 2.1 Involvement of Buying Center Participants**

<table>
<thead>
<tr>
<th>Buying Center Participants</th>
<th>Identification of Need</th>
<th>Establishment of Objectives</th>
<th>Evaluation</th>
<th>Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP- Design</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Manager-Design</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>VP- IT Services</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Engineer</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
</tr>
<tr>
<td>VP- Purchase</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>


participate in one or more of the purchasing related flow. These members are connected by workflow and communication network reflecting formal and informal properties.

**Buying Center Roles:** like in the family, members of buying center also carry similar roles in the buying center. Each role is important and may be followed by one or more person vice-a-versa. We will see roles defined in the following paragraphs in the context of organizational buying.

**Initiators:** initiators are the first persons to recognize the need for the product or service in the organization. They find the gap between the desired goals and the actual performance. For example, in the context of CAD system, a Manager- Design might have suggested use of particular CAD software.
Users: the users are the people who actually will be using the product or services in the organization to create organization’s required final or intermediate product or services. They often initiate the buying process and may develop the product or service specifications. They are the ones who provide feedback on the performance of the purchased product or service.

Influencers: influencers may directly or indirectly guide the Purchase Decision by supplying information, or control the specifications of the purchased product or service. In a CAD/CAM market IT experts, CAD/CAM consultants, Design & production experts can be influencers.

Buyers: buyers have the final authority to select the vendor and negotiate the terms of purchase. Mostly purchase persons or purchasing agents may perform these activities. They also take part in forming the specifications of the purchase. Sometimes the President of the organization also can take part in this activity.

Deciders: deciders are the persons having final authority to select the supplier and make final decision. Normally buyer may be the decider also, but both may be different persons. An engineer sets the specifications and can decide the vendor (decider) but it is finally the purchase person who finally negotiates with supplier and buys the product or service (buyer). Deciders are the most important members of the buying group/buying center, but they may be difficult to recognize.

Gatekeepers: gatekeepers control various forms of information flow into the buying center. For instance the purchasing agents, secretaries may control whether important advertising, promotional material, even the sales persons will be directed to right persons of buying center (like deciders/buyers) or not. Gatekeepers actually identify the buying alternatives for the organization.

Table 2.2 illustrates how different roles may involve at various buying decision process stages. There may be single individual playing all the roles in a very small organization. But in large organizations, there may be separate individuals or groups performing these roles. The marketer has to understand the buying center members and their roles clearly and then position the product effectively.

As buying center is a group of people, there is possibility of developing conflict in the group members.
The first conflict can be due to differences in members’ objectives, personalities and decision making styles. This conflict may result in lack of trust in the buying center. This conflict can be resolved with moving the decision to higher levels in the organization, or offering reward based on group performance (not individual one), or group pressure to dissenters to conform.

Table 2.2  Decision Stages and the Roles in the Buying Center

<table>
<thead>
<tr>
<th></th>
<th>User</th>
<th>Influencer</th>
<th>Buyer</th>
<th>Decider</th>
<th>Gate-keeper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification</td>
<td>✓</td>
<td>✓</td>
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<td></td>
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<tr>
<td>Of need</td>
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<tr>
<td>Establishing</td>
<td>✓</td>
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<td>Specifications and</td>
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<td>Scheduling the</td>
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<td>purchase</td>
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<td>β</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>buying alternatives</td>
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<tr>
<td>Evaluating</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>alternative</td>
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<tr>
<td>buying actions</td>
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<tr>
<td>Selecting the</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>supplier</td>
<td></td>
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</tbody>
</table>

Source: adapted from Book by Loudon, D. L., & Della Bitta, A. J. (2002). Consumer Behavior: Concepts and Applications; as referred on pg 671 published article by Frederick E Webster, Jr., and Yoram Wind, Organizational Buying Behavior pg 80
• A second type of conflict can take place as disagreement between members concerning the criterion to be used in evaluation of vendors and products. This conflict can be resolved by appealing members to take a much broader corporate perspective rather than narrow, individual one.

• The third type of conflict will arise when the members dispute the capabilities of vendors to perform their obligations. This conflict can be resolved by gathering more information about the supplier in the areas of concern.

In the conflict situations buyers have five different styles that handle conflicts depending upon particular constituents involved, as discussed follows:

1. **Competing**: let’s do it my way- the desire to win one’s own concerns at the other party’s expense. This style shows desire to dominate, win-lose power struggle, assertive, uncompromising behavior.

2. **Accommodating**: I see your point of view- the desire to satisfy others’ concerns without attending to one’s own concern. This style shows peaceful coexistence, long-run motives, unassertive, & cooperative behavior.

3. **Collaborative**: maybe we can work this out- the desire to fully satisfy both the party’s concerns. This style shows sharing responsibility, problem solving, in-depth exploration of issue, reaching a mutually beneficial agreement, assertive, cooperative behavior.

4. **Avoiding**: better the situation cool down before we act- exerting an attitude of indifference towards both party’s concerns, postponing the issue, not immediately handling the issue. This style shows unassertive, uncooperative behavior.

5. **Compromising**: let’s split the differences- the desire to reach out an expedient, mutually acceptable agreement which is somewhat short of total satisfaction to both the parties. This style shows exchanging concessions, or seeking middle-ground solution. This is assertive and cooperative behavior.

**Power Relations**: it is very difficult to apply the buying center concept in real practice because of its invisible nature. A marketer being an outsider may not understand who is having the power. Even ranks fail to describe the power. A gatekeeper (secretary) may
throw a salesperson out of a purchase situation if she desires so. Thus the true locus of power must be understood by the marketer.

There may be some individuals in an organization who have powerful influentials in the buying center for a Purchase Decision. They may act as product/service champions promoting its purchase or hold a veto power to stop the purchase. Expert power is the most important determinant of individual’s influence in the buying center followed by reinforcement power (reward/coercive).

2.2.2.4 Individual Factors (Individual Participants)

Participants in the organizational buying process bring to the situation their own individual thoughts, feelings, and actions. These psychological factors are very relevant. For example, one author has suggested that sellers should determine psychological data about customers in order to develop an effective strategy. The types of important data needed by sales representatives include information about who the buying-center members are, how powerful they are and what their positions are, what ‘hot buttons’ each has in terms of specific benefits they want, and how they perceive the vendor. From such information more productive sales calls will result. Organizational buyer behavior is thus comprised of individual behavior in an organizational context. The same individual determinants of consumer behavior could be reviewed to understand their meaning in an organizational buying setting. However, only several of the more significant individual dimensions will be discussed here.

**Motivation:** Motivations of buying-center members are difficult to assess accurately. They have generally been categorized into task-related and non-task-related motives. *Task-related* motives include such needs as product 'quality, price, service, and delivery, or getting the right product for the right price at the right time from the right source. These pertain to the problem leading to the buying decision. *Non-task-related* motives include such variables as potential for promotion, salary increases, more job security, and so forth. Generally, these pertain to the individual's personal advancement, recognition, and desire to reduce uncertainty or risk. Thus, the concept of reward is an important element of the organizational buying process. The marketer must be prepared
to effectively show how buying center members may achieve their goals. A basic rule of motivation is that buyers act selfishly; that is, they try to maximize their gains and minimize their losses in a purchase. In doing so they seek to decompose a product or service into various benefits which can be categorized as financial, product-service, social-political, and personal. Not all buyers will be interested in the same benefits, however, so some represent a higher priority or what may be thought of as ‘hot buttons.’ But because all buyers run a risk that the desired benefits will not be realized, they can only be sold if they are sufficiently confident that the seller will keep his promise.

**Perception:** As we learned earlier, individuals receive and interpret stimuli and organize them into a coherent picture of their world. Organizational buying-center members' perceptions are important to marketers' development of effective strategies. Two dimensions of this element are significant: perceptions of the selling company's products and people, and perceptions of their own role in the buying center decision process.

Buyers will have some overall perception of the seller based on a number of factors. Often this perception, whether accurate or not, is highly instrumental in a seller's success. For instance, companies that are large and well known, such as IBM, are generally perceived by buyers to be better able to keep their promises and therefore, may frequently obtain sales over their lesser-known rivals. Some computer buyers opt for ‘Big Blue’ because there is safety in IBM's image. After all, if product failure occurs, buyers can claim that it is not their fault since they went with the best.

Perception of company sales representatives is also highly influential in supplier choice. In some studies it has been learned that salespeople who understand the buyer's decision process and are most like the buyer themselves are most effective in obtaining the purchase. Obviously, marketers must understand what perceptions buyers have of sellers. This can be effectively obtained by asking sales administrators to periodically evaluate how important buying center members perceive the vendor's products and personnel. Since buyers are much more likely to purchase from those companies' salespeople they like, this is where the most marketing attention should be directed, not among those who view the vendor quite negatively.
A second area of interest in understanding the organizational buying-decision process has to do with the individual's role perception within the buying center. While each of us likes to believe that we are the center of the universe, our importance is overrated. One study of the perceived responsibilities of a group of purchasing agents compared their responses to those of other executives in the same firm. The purchasing agents rated themselves as more important to the purchasing decision than other executives did. Thus, the marketer must be careful to obtain a reasonably objective view of each buying-center member's actual influence in the decision process so as not to waste time and effort.

**Learning**: Learning is another variable strongly influencing the individual in the organizational buying process. Learning occurs as buyers make decisions that are satisfactory and this reinforcement increases their tendency to make the same decision in future similar situations. The continual reinforcement of a decision leads to a habit, which is a relatively automatic response. Just as for final consumers, much organizational buying becomes habitual, which helps to simplify the decision process. The development of a routine purchasing process results in increased reliance on known suppliers to meet the organization's needs for present products and for information on new products. Such buying decisions help the organization to reduce risk of failure by sticking with known sources.

### 2.2.3 Organizational Buying Decisions

In the article (Wind & Webster, August, 1972)\(^8\) Wind & Webster define industrial buying as “the decision making process by which formal organizations establish the need for purchased products and services, and identify, evaluate and choose among alternative brands and suppliers”.

We have reviewed the numerous elements influencing organizational buyer decisions. We now link this information together to examine the types, nature, and variations of the actual decision-making process among organizations.

2.2.3.1 Types of Decision Situations

Final consumers have a continuum of buying-decision types ranging from very habitual or *routine* decisions, to those that entail limited decision making, to those that involve extended decision-making processes. The organizational buying-decision process is analogous to that of final consumers although different terms are generally used to define the stages of the continuum. These buying situations—part of a buy grid model—are sometimes referred to as buy classes and vary depending on such factors as the newness of the problem, the extent to which new alternatives are considered, and how much information is gathered to solve the problem. The three types of buying situations are termed new task, modified rebuy, and straight rebuy.

New task situations are those that are new to the organization. These first time or unique purchases require much gathering of information and careful establishment of the criteria on which to evaluate the product for purchase. The purchase of an extensive electronic security system for a plant is an example of such a purchase. Such purchases may represent the foundation for a strong and continuing profitable relationship between vendor and customer; therefore, they are very significant to marketers.

Modified rebuy situations occur when buyers re-evaluate and may make changes in their available purchase alternatives. For example, an auto manufacturer's robotized assembly system may be re-evaluated by the manufacturer when a competing supplier provides information on its newer, cheaper, and more productive robot welders. Some organizational buying research indicates that new tasks and modified rebuys are rather similar, but straight rebuys are quite different.
Straight rebuy situations are rather routine purchases usually under similar terms of sale to meet continuing or recurring requirements. Purchases of computer ribbons, floor wax, typewriter paper, or delivery truck fuel are examples of routine replenishment from present suppliers as long as satisfaction exists with past products, terms, and service.

**Types of Organizational buying situation**

There exist differences between the buy classes according to the different activities involved in the purchase process. Understanding these differences can help marketers develop more effective strategies depending on the buying situation.

It is also important to understand how buying influences may vary depending on product type in these buy classes. For example, in the purchase of components, engineers are most influential in new task decisions, perhaps because of the need to determine product specifications and ascertain the seller's ability to meet these criteria. For modified and straight rebuy situations, however, purchasing agents exercise the most influence, perhaps because of these decisions' emphasis on price and delivery considerations.

The role of the various influences on organizational buying decisions discussed earlier also varies in these buy classes. For instance, a survey of 200 organization all buyers found that organizational influences are more significant in new task situations (probably because of the economic scope of the decision), while the individual influence of the buyer is more significant in straight rebuy situations.

Although the buygrid framework has become a popular conception of the organizational buying process and a useful analytical tool, its simplicity has been its major weakness. Some studies have found that participation and influence do not vary according to the buy classes. Critics of the framework suggest that there is overreliance on the newness of the task as a primary descriptor and urge that such factors as the complexity and importance of the purchase situation should be included. One researcher has found that
the purchase situation attribute of novelty (lack of buying experience within the organization), complexity (amount of information needed to make an accurate evaluation), and importance (perceived impact on the firm) affect the participation and influence of buying-center members in an industrial Purchase Decision. The study's findings emphasized the necessary role of salespeople to discover and contact members of the buying center beyond the purchasing group. Highly technical products representing a novel and important situation for buyers make it imperative that salespeople supply timely and accurate information showing how the product meets the needs of each individual buyer in order to reduce the perceived risk and differentiate the product from those offered by competitors. Aiming sales efforts at plant management and engineering groups will be worthwhile because these individuals have the greatest participation and influence throughout the process.

2.2.3.2 The Organizational Buyer's Decision Process

Industrial buying like consumer buying is initiated when a need for product or service is recognized. Once a need is felt and formally recorded, a goal oriented activity starts to satisfy this need.

The organizational buying process could be distilled to the same four steps that were described for final consumers, namely problem recognition, information search and alternative evaluation, purchasing process, and post-purchase processes. However, emphasizing the formality of the organizational buying process, it is helpful if we subdivide these stages into greater detail to understand exactly what organizations do. Consequently, we will discuss an eight-step decision process which is been described in the Fig 2.2.

Problem Recognition: As with final consumers, problem recognition occurs when someone in the organization perceives a difference of sufficient magnitude between the desired state and the actual state of affairs. Either external or internal stimuli may be the cause of problem recognition. For instance, an organization may learn externally of new
packaging equipment for its manufacturing operation through a visit to a trade show, an ad seen in an industry trade magazine, or a sales call by a supplier's representative. Such information could cause the manufacturer to realize that increased speed, greater cost-savings, and less downtime could result from purchasing the proposed equipment.

Internally the company could experience problem recognition by such means as having its packaging equipment break down, planning for the launch of a new product which needs different packaging equipment, or undergoing a series of bad experiences with

Figure 2.2  The Organizational Buyer’s Decision Process

outside service representatives from its current packaging machinery supplier. Note that in all these instances, whether external or internal stimuli are involved, problem recognition occurs in order to solve problems or take advantage of new opportunities.

**Need Description:** Once problem recognition occurs, the organization must then generally determine the quantity and describe the characteristics of the item needed. This is analogous to the final consumer determining how much of a certain type of product will fit his needs, but for the organization the level of complexity may be much greater. Standard items such as office supplies are comparatively easy to describe by persons involved in the buying process and they may be obtained from a wide array of roughly equal suppliers. A new weapon system for a branch of the armed services, however, is vastly different, involving perhaps hundreds of people in the general need-description stage to outline the qualities of the product and its required quantities.

**Product Specification:** After the need has been recognized and described, detailed specifications of the product must be prepared by the using department to communicate precisely what is needed. Sellers have opportunities at this and the previous stage to assist the buyer in describing needs and writing specifications. These specifications may include detailed performance requirements, product attributes, service support needs, etc. For complex products, using departments will typically be involved as well as engineering experts and financial executives.

Value analysis or value engineering is an analytical tool used to systematically study the costs and benefits of a material, component, or machine. It asks what function the item performs and whether a better alternative may be available. The best purchase is a product that will satisfactorily perform this function at the lowest cost without loss of quality. A checklist of questions may be used to analyze the item or component. When organizations apply value analysis to their purchasing, they become more aware of substitutability, consolidating, eliminating, simplification, and standardization. Such a buying orientation leads to a continuous search for new materials, processes, and products to perform a task better and/or at less cost.
**Vendor Search:** At this stage the organization tries to identify companies who may be appropriate suppliers of the specified product. Actually, for many situations this stage is more closely linked with previous stages than appears to be the case here. In order for the organization to write its specifications on complex products, it must start with what products and suppliers currently exist, moving from there to the next stage which may involve decisions on. The ‘who’ and ‘how’ of supply for an item which is presently unavailable in the marketplace. Sometimes a company will decide to make it rather than buy it.

Organizational buyers have a wide range of information sources to use in their assessment of products and supplies: visits by sales representatives from potential suppliers, trade shows, trade publication articles and advertising, direct mailings, professional and technical conferences, Yellow Pages, trade directories, and word-of-mouth, to name some of the more significant ones.

The organizational buyer's evoked set of suppliers or brands will include those who are thought to be able to satisfactorily meet a buyer's requirements. Such suppliers may even be on a list of approved suppliers. Vendors who are on this list or in the buyer's evoked set will face a different and far easier challenge than those who are off the list or outside the buyer's consideration.

The marketer must work to blend the correct promotion mix so that potential buyers are aware of the firm, have a favorable image of it, and consider it as a supplier.

**Proposal Request:** Particularly with new task and modified rebuy situations, the company may next send a request for proposal to qualified vendors asking them to bid based on the product specifications. Suppliers who respond to the request will submit a proposal via perhaps a catalogue, a sales call, or a detailed written offer specifying product or service features, terms of supply, and price. Large companies may establish an approved vendor list which limits to carefully chosen suppliers, those who may submit bids on products. For example, a fast food operation may require its franchise
outlets to obtain most supplies only from distributors who have been approved through an extensive evaluation process.

**Vendor Selection:** The supplier/product choice decision is made by one or more members of the buying center based on the proposals submitted. One conceptualization of the vendor selection decision-making process suggests two possible strategies a firm may pursue: simultaneous scanning or sequential evaluation. In simultaneous scanning a company arrays and reviews potential suppliers at the same time, whereas in sequential evaluation the potential vendors are first ranked and then evaluated sequentially until one is found that satisfies purchase needs. Sequential evaluation would likely occur in the case of straight rebuys or when one supplier is clearly predominant in a market. Simultaneous scanning is likely in a new task buying situation or when several attractive potential vendors are available. One research study discovered that buyers select a few qualified sellers on the basis of such criteria as dependability, reliability, and price, and then choose a product from these vendors based on technical specifications.

In addition, the selling firm must recognize that groups in the buying center have different areas of dominance. For instance, one study learned that engineers and production managers have the greatest influence in the product selection decision while purchasing agents are most influential in the selection of a vendor.

There are a number of evaluative criteria used in making the selection of a supplier. There are some typical attributes considered by the buying center. Such characteristics may be rated for each supplier in order to select the best candidate. Generally it appears that the criteria used by the buying center range in order of importance as follows: product quality, product availability, service capability, vendor reputation, product warranty, and price. However, these objective criteria may not always dominate decisions. Research indicates that previous relationships with a supplier and the existence of a well-known name by the vendor can sometimes be more important than such things as price and delivery.
**Purchase Routine Selection:** This stage involves placing an order (specifying all terms of purchase) with a vendor who processes it and ships the product. It is then received, approved, and payment is made. Status reports within the company will let management know whether timetables are being met. Rather than writing a purchase order for each purchase in a straight rebuy situation, companies often negotiate a contract to cover purchases over a specific length of time.

**Post-purchase Evaluation:** The last step in the Purchase Decision process involves an evaluation of the supplier's performance by the buyer. This is an important stage in providing feedback so that the buyer and seller will be better able to work as a team. Management may periodically have several departments rate the supplier’s performance on such criteria as product quality, delivery, and post-sale service. The overall rating developed is used by the buyer to make decisions about continuing to use the supplier or perhaps switching to an alternative source. Vendors may also receive the report so that they can modify their performance where necessary to better serve customers' needs.

**2.2.4 Buying Behavior Models**

After the basic discussion of the buying behavior, let us now discuss two very important Buying Behavior models proposed by Webster and Wind and Jagdish N Sheth.

**2.2.4.1 The Webster and Wind Model**

This model (Wind & Webster, August, 1972) of organizational buying behavior borrows some important concepts from the behavioral theory of the firm and the other approaches to the explanation of organizational behavior. Integrating these concepts into a comprehensive organizational buying behavior model permits a richer view of buying process and provides a framework for analyzing and studying the several

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variables influencing the industrial buyer’s responses to marketing effort. Refer to the figure 2.3.

Figure 2.3 Webster and Wind Model

Source: from Journal Wind, Y., & Webster, F. E. (August, 1972,). Industrial Buying As Organizational Behavior
Any organization is a multivariate system in which there are at least four sets of interacting variables: task, structure, technology and people. These interdependent variables provide organizational members i.e. the people with much of the information concerning assumptions, goals, attitudes and expectations with regard to themselves and others who enter into decision making. Since these variables affect all forms of organizational decisions, it is important to distinguish the specific nature and scope of them in the context of organizational buying decisions. These relations are shown in the following fig 2.4.

**Figure 2.4  The Key Organizational Variables**

This model of the buying organization stresses three major points: First, the specific organizational buying variables—the buying task, structure, technology, and people—are affected by the overall organizational variables—task, structure, technology, and people. For example, the degree of organizational decentralization determines to a large extent
the specific structure of the purchasing department and the buying center. This interdependency of purchasing with the other parts of the organization is of considerable importance in any attempt to understand organizational buying behavior. Hence, subscribing to the system approach requires an understanding of the specific links between the organizational buying variables and the overall organizational variables. The second point stressed in this model is the effect of the organizational climate on the four basic sets of organizational variables. The third and primary focus of the model is on the nature and scope of the specific organizational buying variables.

**Research on Organizational buying Behavior**

The first step in conducting any research is the careful definition of the problem to be studied, which provides a guideline for the development of a problem-specific model which relates several variables (e.g., specific marketing stimuli, organizational and individual characteristics) to the relevant organizational buying responses (e.g., purchase, attitude, and loyalty). Such models can provide the necessary guidelines for research design.

The general block model of organizational buying behavior suggested in Figure 2.3 is too general and comprehensive to provide useful guidelines for a specific research problem. It can suggest, however, a set of variables and hypothesized relationships for inclusion in any problem-specific model (a model designed for the structuring of a specific problem concerning organizational buying behavior).

If published studies represent actual practice, rarely have such models been developed explicitly. Yet, progress in organizational marketing suggests the need for such models to provide guidelines for the collection of both specific information about key accounts (to be gathered by the salesman as part of his normal activities) and more general information about the organizational buying process. This latter type of information must be gathered from time to time as the basis for developing more-general marketing strategies. These broader market strategies provide the guidelines within which key
account strategies can be developed. Without such information about the buying process that is characteristic of substantial segments within the total market, each account situation must be approached de novo. More-efficient planning can result from verified models of the organizational buying process.

Given such specific models, data on organizational buying behavior can be generated by survey, observation, or experimentation and should be analyzed by the appropriate analytical techniques. Such procedures have been used extensively in the study of consumer behavior but only rarely in organizational buying behavior studies. Yet, there is no conceptual or technical justification for this situation. Analysis of variance, for example, is as applicable in organizational buying experiments as in consumer buying experiments.

Similarly, multivariate statistical techniques (e.g., multiple classification analysis, regression and correlation analysis, multiple discriminate analysis, and factor analysis) can be used for analyzing no experimental (observational and survey) data on organizational buying behavior. These tools enable the researcher to look simultaneously at the effects of a reasonably large number of factors on organizational buyer behavior. Yet, there have been few organizational buying behavior studies that used any of these techniques.

A similar situation exists with respect to multidimensional scaling techniques and evaluation-function procedures. The only exceptions are a number of exploratory and pilot studies conducted by one of the authors. Multiple regression and discriminate analyses were used in a study of industrial source loyalty. In Multidimensional scaling techniques have been utilized in a pilot study aimed at assessing whether industrial buyers’ perceptions and preferences of various suppliers differ across products and different buying situations.
2.2.4.2 The Jagdish N Sheth Model

A Description of Industrial Buyer Behavior The model of industrial buyer behavior is summarized in Figure 2.7 (Sheth, October 1973)\(^{10}\). It is a generic model which attempts to describe and explain all types of industrial buying decisions. Organizational buyer behavior consists of three distinct aspects. The first aspect is the psychological world of the individuals involved in organizational buying decisions. The second aspect relates to the conditions which precipitate joint decisions among these individuals. The final aspect is the process of joint decision making with the inevitable conflict among the decision makers and its resolution by escorting to a variety of tactics.

The present model specifies five different processes which create differential expectations among the individuals involved in the purchasing process: (a) the background of the individuals, (b) information sources, (c) active search, (d) perceptual distortion, and (e) satisfaction with past purchases. These variables must be explained and operationally defined if they are to fully represent the psychological world of the organizational buyers.

Expectations refer to the perceived potential of alternative suppliers and brands to satisfy a number of explicit and implicit objectives in any particular buying decision. The most common explicit objectives include, in order of relative importance, product quality, delivery time, quantity of supply, after-sale service where appropriate, and price) However, a number of studies have pointed out the critical role of several implicit criteria such as reputation, size, location, and reciprocity relationship with the supplier; and personality, technical expertise, salesmanship, and even life style of the sales representative. In fact, with the standardized marketing mix among the suppliers in oligopolistic markets, the implicit criteria are becoming marginally more and more significant in the industrial buyer's decisions.

Figure 2.5  Sheth Model of Industrial Buying

Background of Individuals
The first, and probably most significant, factor is the background and task orientation of each of the individuals involved in the buying process. The different educational backgrounds of the purchasing agents, engineers, and plant managers often generate substantially different professional goals and values. In addition, the task expectations also generate conflicting perceptions of one another's role in the organization. Finally, the personal life styles of individual decision makers play an important role in developing differential expectations.

Information Sources and Active Search
The second and third factors in creating differential expectations are the source and type of information each of the decision makers is exposed to and his participation in the active search. Purchasing agents receive disproportionately greater exposure to commercial sources, and the information is often partial and biased toward the supplier or the brand.

Perceptual Distortion
A fourth factor is the selective distortion and retention of available information. Each individual strives to make the objective information consistent with his own prior knowledge and expectations by systematically distorting it.

Satisfaction with Past Purchases
The fifth factor which creates differential expectations among the various individuals involved in the purchasing process is the satisfaction with past buying experiences with a supplier or brand. Often it is not possible for a supplier or brand to provide equal satisfaction to the three parties because each one has different goals or criteria.

Determinants of Joint Vs. Autonomous Decisions
Not all industrial buying decisions are made jointly by the various individuals involved in the purchasing process. Sometimes the buying decisions are delegated to one Party, which is not necessarily the purchasing agent. It is, therefore, important for the supplier to know whether a buying decision is joint or autonomous and, if it is the latter, to
which party it is delegated. There are six primary factors which determine whether a specific buying decision will be joint or autonomous. Three of these factors are related to the characteristics of the product or service (2a) and the other three are related to the characteristics of the buyer company (2b).

**Product-Specific Factors**

The first product specific variable is what Bauer calls *perceived risk* in buying decisions. Perceived risk refers to the magnitude of adverse consequences felt by the decision maker if he makes a wrong choice, and the uncertainty under which he must decide. The second product specific factor is *type of purchase*. If it is the first purchase or a once-in-a-lifetime capital expenditure, one would expect greater joint decision making. On the other hand, if the Purchase Decision is repetitive and routine or is limited to maintenance products or services, the buying decision is likely to be delegated to one Party. The third factor is *time pressure*. If the buying decision has to be made under a great deal of time pressure or on an emergency basis, it is likely to be delegated to one party rather than decided jointly.

**Company-Specific Factors**

The three organization-specific factors are *company orientation, company site*, and *degree of centralization*. If the company is technology oriented, it is likely to be dominated by the engineering people and the buying decisions will, in essence, be made by them. Similarly, if the company is production oriented, the buying decisions will be made by the production personnel. If the company is a large corporation, decision making will tend to be joint. Finally, the greater the degree of centralization, the less likely it is that the decisions will be joint.

**Process of Joint Decision Making**

The major thrust of the present model of industrial buying decisions is to investigate the process of joint decision making. This includes initiation of the decision to buy, gathering of information, evaluating alternative suppliers, and resolving conflict among the parties who must jointly decide.
Critical Role of Situational Factors

The model described so far presumes that the choice of a supplier or brand is the outcome of a systematic decision-making process in the organizational setting. However, there is ample empirical evidence in the literature to suggest that at least some of the industrial buying decisions are determined by ad hoc situational factors.

Implications for Industrial Marketing Research

The model of industrial buyer behavior described above suggests the following implications for marketing research. First, in order to explain and predict supplier or brand choice in Industrial buyer behavior, it is necessary to conduct research on the psychology of other individuals in the organization in addition to the purchasing agents. Second, it is possible to operationalize and quantify most of the variables included as part of the model. While some are more difficult and indirect, sufficient psychometric skill in marketing research is currently available to quantify the psychology of the individuals. Third, although considerable research has been done on the demographics of organizations in industrial market research—for example, on the turnover and size of the company, workflows, standard industrial classification, and profit ratios demographic and life-style information on the individuals involved in industrial buying decisions is also Deeded. Fourth, a systematic examination of the power positions of various individuals involved in industrial buying decisions is a necessary condition of the model. The sufficient condition is to examine trade-offs among various objectives. Fifth, it is essential in building any market research information system for industrial goods and services that the process of conflict resolution among the parties and its impact on supplier or brand choice behavior is carefully included and simulated.

Finally, it is important to realize that not all industrial decisions are the outcomes of a systematic Decision making process. There are some industrial buying decisions which are based strictly on a set of situational factors for which theorizing or model building w.ill not be relevant or useful.
2.2.5 Attributes

The above discussion about organizational buying behaviour discusses various factors influencing the Purchase Decision. However, this research is mainly focussed on attributes of the CAD/CAM products that impact the Purchase Decision. The researcher intends to study the impact of attributes of CAD/CAM products with an assumption that the factors of organizational purchase remain similar. Thus, attributes referred in this research have reference to product attributes and not the factors as discussed above.

When a manufacturer buys a large quantity of a product, typically several potential suppliers are invited to make offers. The offers are submitted in writing, and the buyers select the most attractive one. This, the traditional system of business buying has worked for years, but it has left buyers with a nagging question: Am I paying the lowest possible price for the desired product? Etzel, Walker, Stanton & Pandit (Etzel, Walker, Stanton, & Pandit, 2006)\(^\text{11}\) further quote “Some suppliers dislike the system because they think it puts too much emphasis on price, discouraging consideration of other factors that may be equally important.”

In evaluating Purchase Decision, we are evaluating the attributes that are important for that purchase. The industrial buyer often examines sets of attributes across sets of products or brands. The buyer’s attitude toward a product is determined by the buyer’s beliefs about a product’s performance on various attributes that are important in the Purchase Decision. It is important to note that the attributes will vary in importance to the buyers. Thus, the higher a product is rated on attributes that are important to the buyer, the more likely it becomes that the product will be purchased by that buyer. Thus, a buyer first determines what attributes are important for buying a particular type of product. For instance, in the purchase of a place of an office, a buyer may decide location, floor in the building, price, and area in sq ft are important criteria. In most cases, the criteria have different weights. In other words, location may be the most important and others may not be so important in a situation, but in some other case floor may be important than others (show room). Then the buyer rates each place along these

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criteria & the place that is chosen is usually the one with the best overall score. It is unlikely that one product will get the top score in every category. There are trade-offs between the products being evaluated and the criteria used for selection.

### 2.3 Previous Research

Research papers on CAD/CAM product buying behaviour are not available. Most of the papers available in the CAD/CAM market are technical in nature where various products are studied for a particular case. The emphasis for CAD/CAM papers mainly remains on technical features of a product that scored over others in a particular domain, or design/ manufacturing cases. None are available on the Purchase Decision as a whole with specific consideration to various attributes.

A few research papers are available on industrial buying behaviour. Some of them have considered attributes of buying and their relationship with the buying decision. Some have considered intangible attributes like perception, branding, cultural aspect like country of origin, while some have considered technical features, quality of service, & price as tangible attributes. Main products considered are tangible products and most cases intangible products are not considered. Let us discuss some of the papers in the following paragraphs.

Swati Jantrania’s research (Jantrania, December 2002)\(^\text{12}\) deals with the value perceptions of customers related to a product or service. This is because the ability to create superior customer value is considered to be a prime source of sustainable competitive advantage for businesses. This is also a central principle of the means-end theory proposed by Peter & Olson, in 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.

Swati Jantrania has conducted a survey of 60 customers of a telecom product pronto (from Skycorp) spread over 40 organizations. Interviewing and data analysis technique called laddering which is based on the means-end theory is used in this study. The interview data were coded in specific categories of attributes (A), benefits (B), and end goals (E) to create an implication matrix. Such a matrix shows the number of links among A, B, and E, which is called customers’ value dimensions underlying prontom 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. A, B, E thus derived were further analyzed for different segments using proportions and cluster analysis.

Jantrania studied around 18 different attributes that are clubbed to form 6 different groups viz. Product feature, service feature, price/ project cost, service cost, supplier attributes and sales staff attributes. She had referred to Peter and Olson’s means-end chain of customer’s product knowledge follows from Attributes to consequences then to values (Peter & Olson, 1993).13

Figure 2.6 Attributes & Values (Research of Jantrania S)


These attributes are further divided in to concrete and abstract attributes; consequences are divided in to functional and psychological consequences; and values divided in to instrumental and terminal values. Further the above clubbed 6 group attributes provide functional & operational benefits; financial & economic benefits; & social and psychological benefits. Finally these benefits result in achievement of Organizational and Personal Goals.

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The main contribution of this research to the academia is the theory building by the conceptual framework of customer value. The research is a part of the important process of discovery and not of a validation study.

Another research from Alkhalil (Alkhalil, June 2007)\textsuperscript{14} emphasised on impact of the quality of technical support (tech support) on customers’ attitudes and behaviours in an organizational buying context. Most of the organizations use technical support as a differentiator from competitors in very competitive environment. This study identifies three main mechanisms by which tech-support influences customers’ repurchasing intentions. First, tech support can enhance customers’ perceived quality and trust, which can in turn increase their repurchasing intentions. Second, satisfaction with the service highly affects trust in the supplier, which in turn leads to repurchasing intentions, where trust and satisfaction can be achieved after cumulative satisfying transactions. Third, tech support may not increase customers’ perceived value. The study also states that despite the high competition, competing mainly on the basis of price reduction of goods offered will not necessarily increase customers’ repurchasing intentions.

Alkhalil estimated the overall model with six latent variables and their respective measures tested the model. These variables were tech support (TS), perceived value (PV), perceived quality (PQ), satisfaction (Sat), trust (Tr), and repurchasing intensions (RI), where PQ was measured with two composite indicators with two dimensions, perceived service quality (PSQ) and perceived product quality (PPQ). The remaining latent variables (TS, PV, Sat, Tr, RI) were measured with their respective reflective indicators, given that these variables were treated as one dimensional constructs. Following hypotheses and their acceptance:

- Buyer’s perceived quality of the supplier’s products would be positively associated with the quality of tech support, which was accepted.
- The quality of tech support would positively influence the buyer’s perceived value of the supplier’s products, which was not accepted.

The quality of tech support would positively influence the buyer’s satisfaction with the supplier’s products, which was not accepted.

The quality of tech support would positively influence the buyer’s trust in the supplier, which was accepted.

Customer perceived quality would positively influence customer satisfaction, which was strongly accepted.

Customer perceived quality would positively influence customer-perceived value, which was strongly accepted.

Perceived quality would positively influence the repurchasing intentions of existing buyers, which was accepted.

Customer perceived value would positively influence the repurchasing intentions of existing buyers, which was not accepted.

Customer satisfaction would positively influence the repurchasing intentions of existing buyers, which was accepted.

Customers’ trust in their supplier would positively influence the repurchasing intentions of existing buyers, which was accepted.

Alkhalil used correlations, factor analysis, structured equation modelling for analysis of data.

John Novak (Novak, Correlational Study of Organizational Factors that Influence Supplier Development: A Buyer Firm Perspective (Doctoral dissertation), August 2008) suggests in his study that supplier development should result in terms of supplier’s quality, delivery, cost, and technology advancement. The research involves in studying the development of supplier as a very critical process for an organization. Despite a thorough and deliberate supplier selection process, suppliers are not performing adequately to the organization’s expectations. Novak’s purpose was to study and analyze the relationship between the independent variables of information exchange, understanding of goals, supplier participation, supplier leadership attitude, coordinator presence, and supplier dependence on buying firm. As stated earlier he referred to supplier development that should result in quality, delivery, cost, and

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technology advancement. The study had a response where survey data was related; 43 in quality, 35 in cost, 27 in delivery, and 18 in technology.

In this Novak’s research, supplier development involved the transfer of resources for the purpose of improving the suppliers’ performance and capabilities. Factors that were potentially important for organizations to focus on to produce satisfactory results from supplier development activities were identified through an investigation of supplier development literature. Supported by the literature, a model of important factors contributing to successful supplier development results was constructed. To examine the model, data were collected from one large automotive supplier that has been practicing supplier development activities for over 5 years. Data were collected through the use of a self-administered survey instrument with some data mining. The relationship of:

- information exchange was positively correlated to quality, delivery, cost, and technology,
- understanding of goals was positively correlated to quality & delivery, and negatively correlated to cost, and technology,
- supplier participation was positively correlated to technology & delivery, and negatively correlated to cost, and quality,
- supplier leadership attitude was positively correlated to cost, technology, & delivery, and negatively correlated to quality,
- buyer firm’s coordinator presence was positively correlated to cost, technology, & delivery, and negatively correlated to quality, and
- Supplier dependence on buying firm was negatively correlated to quality, delivery, cost, and technology.

Novak’s research was from a customer’s perspective of a supplier. He finally concluded that: Higher collective levels of information exchange, understanding of goals, supplier participation, leadership attitude, buying firm’s coordinator presence, and suppliers’ dependence on buying firm will result in a higher supplier development outcome in the areas of quality, delivery, cost, and technology.
The study conducted by Brian Brown (Brown, June 2007)\textsuperscript{16} deals exclusively with the aspect of sensitivity of branding in context of industrial buying behaviour. An organizations’ tendency to select branded products as against selecting lesser-known or generic products (while selecting suppliers), is referred to as brand sensitivity. This study tried to suggest a conceptual model defining the conditions that are likely to increase or decrease the brand sensitivity. The scope of the study is divided into 6 key decisions Product type, Industry, Brand Approach, Buying Context, Purchase Situation, & Purchase Stage. Respondents divided into 4 groups. Each group completes three scenarios. Scenarios involve manipulating antecedent variables to influence risk levels and brand sensitivity levels Individual risk attitude via scale. Brand sensitivity is measured by two methods; first is via scale and brand sensitivity and second is via constant sum approach.

It is found at Brown’s research that the concept of intangibility is the key determinant of brand sensitivity in organizational contexts. It confirms suggestions of and raises additional questions about the tangibility of B2B products, as they appear to skew towards the intangibility end of the tangibility-intangibility spectrum and even into the services marketing domain. Thus, intangibility is a theoretical concept critical for understanding the role of branding in the organizational buying process. Buying center members, including purchasing agents, via a “pay-for-input” online panel managed by e-Rewards Market Research, Inc (“e-Rewards”) were surveyed. Only those buying center members who play an influential role in purchasing decisions were included.

Brown’s study is significant study of branding in a B2B context, as it combines multiple methodologies and samples that include actual buying managers employed by industrial entities. Moreover, it makes several key contributions to academic literature and managerial practice. Results of this study contradict assumptions about buyers’ reliance on purely functional and tangible product factors like price and functionality. It supports the growing body of literature that indicates that supplier selection may be strongly

influenced by intangible factors such as reputation, buyer-seller relationship, or brand image.

Friend at Georgia State University studied in detail the factors affecting a win or a failure in sales (Friend, May 2010)\textsuperscript{17}. This research proposes to overcome sales failure attribution biases by collecting data from the industrial buyer’s perspective. Thirty five post-mortem interviews with procurement decision makers from buying organizations were collected following a failed sales proposal. The context of these failed sales proposals was for multi-year industrial service key account contracts (>\$5 Million). The result of this naturalistic inquiry is a model which outlines the determinant attributes of sales failure: price, adaptability and relationship-potential. The study involves evaluation of a lost sale of big multiyear- project or service contracts by an organization.

Friend’s study refers to the sales proposal being selected or rejected by the customer with a view to three important aspect of price, adaptability of sales proposal and relationship potential of a sales proposal. These aspects were judged for being high, moderate, and low. The study thus concentrates on intangible aspects of the sale proposal. The contexts of the sales proposal selection contained individual (e.g., salesperson), organizational (e.g., sales organization) and external attributes (e.g., competitor proposal). These overarching factors were depicted throughout the various constructs and sub-constructs of non-adaptive sales proposals, non-relational sales proposals and excessive customer-perceived sacrifices. The outcome of the qualitative findings resulted in thematic dimensions, represented though exemplar quotations, and a conceptual model of the sales failure process. These findings were realized through the organizational purchasing decision makers’ perspective.

Friend finally concludes that the results of this analysis are enlightening in regard to the drivers of sales failures and how organizational buyers make decisions not to select a given sales proposal. The three primary themes identified in this analysis include a lack

\textsuperscript{17} Friend, S. B. (May 2010). \textit{Why Are You Really Winning and Losing Deals: A Customer Perspective on Determinants of Sales Failure (Doctoral dissertation)}. Department of Marketing at ScholarWorks @ Georgia State University.
of sales adaptability, a lack of relationship-potential and excessive total cost of ownership. Further, the research indicates the primary components of this decision follow the value framework, in which the buyer evaluates the relative adaptability and relationship-potential versus the perceived total cost of ownership. The ultimate purchasing decision is also a function of this value framework relative to the value offered by the competitor’s proposal. The resulting comprehensive sales failure model expands across attributes at the individual (i.e., salesperson), organizational (i.e., sales organization) and environmental (i.e., competitors) levels.

Piscopo (Piscopo, May 2013)\textsuperscript{18} studied customer value in terms of relation of quality and cost. The assumption is that coordination and collaboration between buyer and seller create value for both firms by reducing costs and expanding revenue opportunities. However, such value creation mechanism does not work every time. Closer relationships require customer specific investments and a higher level of service that may create more cost to the seller than the potential gain in revenue, negatively impacting profitability of the selling firm.

Piscopo considered finding Customer Lifetime Value (CLV) with following hypotheses:

- The quality of the relationship between customer and supplier is positively related to the price that the customer pays for purchased product: which is not accepted
- The higher the quality of the relationship between customer and supplier, the higher the percentage that the supplier represents of the customer’s total category purchases: which is accepted
- The quality of the relationship between customer and supplier is positively related to the proportion of high margin products that the customer purchase: which is not supported
- The quality of the relationship between and customer and supplier is positively related to the existence of efficiency drivers in the relationship: which is accepted

\textsuperscript{18} Piscopo, M. G. (May 2013). \textit{Effect of Relationship Quality and Cost to Serve on Customer Value in Business Market (Doctoral dissertation)}. Department of Marketing at ScholarWorks @ Georgia State University
• The quality of the relationship between and customer and supplier is positively related to the existence of complexity drivers in the relationship: which is accepted
• The presence of efficiency drivers in a customer relationship reduces the cost-to-serve such customer: which is accepted
• The presence of complexity drivers in a customer relationship increases the cost-to-serve such customer: which is accepted
• The higher the quality of the relationship between and customer and supplier, the higher the customer lifetime value of such relationship: which is not accepted

Another research by Morssinkhof (Morssinkhof, 2007)\(^{19}\) relates to accuracy in Total Cost of Ownership (TCO) and Purchase Decision. The study involves various costs involved with a purchase before, and after the purchase. Study considers Purchase Decision as a managerial decision making process that consists of multi attribute decision or multi criteria problem even TCO is fully known, as suggested by Hwang and Yoon in 1981. The characteristics of these multi criteria are:

• multiple attributes: the alternatives will have more attributes technical specs, price, delivery, etc,
• conflict among attributes: one attribute may be good in one alternative (say quality) while, other alternative will have another good alternative (say price)
• incommensurable dimensions: attributes will have different units (Rupees, kilogram, meter etc)

The Morssinkhof’s study then relates to reflective thinking. Accurate estimation of TCO is not possible. So the estimation of these inaccuracies, reflective thinking and experience drive the final decision. There will be three inaccuracies in TCO. One is due to non financial attribute included at minimum cost. Second is due to nonfinancial attribute included with maximum cost; while third is non financial attribute excluded from the cost number. His results were:

• Low decision complexity results in more weight for an attribute not included in the TCO numbers.

• High decision complexity results in less weight for an attribute not included in the TCO numbers.
• Reflective thinking results in more weight for the attribute inaccurately included in the TCO numbers.
• More experienced decision makers attach more weight to the TCO numbers, compared to less experienced decision makers.

The study by Mudambi (Mudambi, July 1998)\textsuperscript{20} emphasised more on branding as an important attribute in industrial buying. The thesis introduces a continuum of industrial brands from commodities to independent brands. Functional benefits form the foundation of value, yet industrial branding emphasises that intangible and emotional values can also affect the choices customers make. Successful branding engineers a close fit between the benefits desired by customers and the tangible and intangible features of the brand.

Mudambi’s Analysis of the survey data reveals that branding is important. But it is not important to all buyers or in all situations. Thesis covers the survey on bearings purchases, and on circuit-breakers. The relative importance of branding is found to be a significant factor in the creation of three distinct buyer clusters, a branding receptive cluster, a high tangibility cluster, and a low relevancy cluster. The importance of branding is found to be related to a number of buyer, purchase and decision process characteristics. What Mudambi has proposed is a product has to move from being only a commodity to a basic brand then to an augmented brand to a company brand then to an individual brand and finally an independent brand.

\textbf{Figure 2.7} \hspace{1cm} \textbf{Brand Development}

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Commodity Product & Basic Brand & Augmented Brand & Company Brand & Individual Brand & Independent Brand \\
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Research by LeBlanc (LeBlanc, 1981)\textsuperscript{21} investigates the information processing strategies by organizational buyers while selecting the suppliers. The varying levels of risk, familiarity and informational requirements of the buying situation should impact the information processing strategies. Data was collected from 135 organizational buyers from 78 different organizations. Is there a difference in decision rules or information processing strategies utilized by the organizational buyers in the development of evoked set of qualified suppliers when the buyer is qualifying suppliers for a new task, modified re-buy or straight re-buy buying task?

The analysis by LeBlanc shows that the buying task significantly influences the information processing strategies, but all of the buying strategies were reported as being used for each of the buying task. The compensatory information processing strategies are involved in high risk buying situations. The findings of the study are:

- The utilization of information processing strategies was significantly related to buying task the organizational buyer faced.
- The compensatory information processing strategies are used in conditions of lower supplier and product homogeneity than the non compensatory strategies.
- The weighted compensatory model is used in the conditions of higher supplier familiarity than the un-weighted compensatory model.
- The disjunctive model is utilized in conditions of higher familiarity with the product than the conjunctive model.
- There is no significant level of information load associated with the use of disjunctive and lexicographic information processing model.
- The lexicographic model is used when there are a large number of suppliers to be considered unlike the conjunctive model.

The empirical study at Stanford by Gao (Gao, June 2008)\textsuperscript{22} involves a very important aspect of Purchase Decision sequence: buy-select or select-buy. Buy-select Purchase Decision sequence is one where customer first decides whether to buy and then makes selection from the choice list. A select-buy decision sequence involves customer to first make a selection and then decide whether to make a purchase. The sequence in a Purchase Decision is very important in any organization and both the sequences have their own characteristics.

As per Gao, making a Purchase Decision involves two decisions: a selection decision and a buy/no-buy decision. A selection decision is one where we decide which option to select from available alternatives. A buy/no-buy decision involves buying a product now or postponing the Purchase Decision to a later date. Both these decisions can be taken simultaneously. But the researcher proposes that whatever is the first applicable information, that shapes our mind to make the decision. For buy-select sequence, overall attractiveness of the choice determines the decision. For a select-buy decision sequence, factors that facilitate the selection decision will be determinants of the purchase (preference clarity). Hedonic nature of choice set and shared missing information are influential in the buy-select sequence than in select-buy sequence of Purchase Decision. Attribute alignability and dominance structure are influential in select-buy sequence than buy-select sequence of Purchase Decision.

### 2.4 Gap Analysis and Scope

In the studies of above researches, there are various Industrial Product Attributes are studied. They are Quality, Reliability, User-friendliness, Customization, Expandability, Delivery, Tech Support, AMC, expertise availability in market, Price, Commercial Terms, Data Compatibility, Perception, & Brand Image.

Jantrania’s study involves various attributes like Quality, Reliability, User-friendliness, Expandability, Delivery, Tech Support, AMC, Expertise availability in market, Price,

\textsuperscript{22} Gao, L. (June 2008). *Contrasting buy-select and select-buy: Set attractiveness versus relative option attractiveness as determinants to decisions to Purchase* (Doctoral dissertation). Stanford University. Retrieved from ProQuest Dissertation and Theses. (UMI No. 3313573)
Commercial Terms, Perception. These attributes in turn provide some benefits and these benefits provide means to some goals. Even the study concerns high tech telecommunication product, it does not contain any reference to the data compatibility issues. The telecom product has to be compatible to various communicating devices like computers, public address systems, & data acquisition systems. The study does not deal with the attribute of customization which is very important for a high tech industry. Branding issue is also not covered in the study.

Alkhalil’s research involved Quality, Reliability, Expandability, Delivery, Tech Support, AMC, Price, Commercial Terms, Perception, and Brand Image in the research. However it did not consider the aspects of User-friendliness, Customization, Expertise availability in market, Data Compatibility. As the survey data were collected from scientists in the pharmaceutical industry located in the New York and New Jersey areas, the above aspects were not of importance.

Novak’s research was exhaustive it covered quality, delivery, cost and technology advancements. Perception about product/ service was considered through points of info exchange, & references to goals about the supplier development. He considered technology separately. CAD/CAM being high-tech technology products, technology need not be considered separately as it is an integral part of the product. However his research did not consider data compatibility issues related to intangible products like IT or CAD/CAM. The issues of Reliability, Customization, Expandability, Tech Support, AMC, Expertise availability in market, Commercial Terms were not considered. It also did not take into consideration intangible attribute like branding of products or services.

Brian Brown’s study was on brand sensitivity which deals with intangible parameters mainly. It covered Quality, Reliability, Price, Commercial Terms, Perception, & Brand Image. It was conducted for buyers from various organizations and industries so User-friendliness, Customization, Expandability, Delivery, Tech Support, AMC, Expertise availability in market, Data Compatibility aspect were not studied. The study was too focussed on brand sensitivity and the intangible aspects of Purchase Decision.
Friend’s research was related to a sales proposal’s failure analysis and covered the aspects of Quality, Reliability (in terms of trust), Customization (in terms of feature adaptability), Expandability (in terms of future adaptability), Delivery, Tech Support, Price, Commercial Terms (price is proxy for TCO), Perception, & Brand Image (in terms of brand sensitivity). However it does not consider the aspects of User-friendliness, AMC, Expertise availability in market, Data Compatibility in the success/failure of a sales proposal.

Piscopo’s study was very exhaustive. It covered Quality, Reliability, Customization, Delivery, Tech Support, AMC, Price, Commercial Terms, & Perception aspects of the Purchase Decision. The aspects that were not covered in the study were User-friendliness, Expandability, Expertise availability in market, Data Compatibility, & Brand Image.

Morssinkhof’s study related to Quality, AMC, Price, Commercial Terms, & Perception. On the whole it relates mostly to the Total Cost of Ownership and does not include aspects like Reliability, User-friendliness, Customization, Expandability, Delivery, Tech Support, Expertise availability in market, Data Compatibility, Brand Image.

Mudambí’s research is mainly concerned with branding and also takes into account attributes like Quality, Reliability, Delivery, Tech Support, AMC, Price, Commercial Terms, Perception, & Brand Image. The aspects not covered in her study are User-friendliness, Customization, Expandability, Expertise availability in market, & Data Compatibility.

LeBlanc’s study comprises of studying the information processing strategies and the evoked suppliers. It involves risk in buying situation, compensatory & non-compensatory information processing strategies, supplier homogeneity, product homogeneity, conjunctive strategies, disjunctive strategies, lexicographic strategies. It does not study any of the attributes that are studied under this research.
Gao’s study was concentrated on buy-select or select-buy sequence of Purchase Decision only. It did not take into account the other attributes in detail. Her study considered quality and price attributes only from our attribute list.

**Gap and Scope:** Table 2.3 summarizes the Gap in the current available literature. The table clearly indicates that following attributes are not covered by majority of the studies:

**User-friendliness:** this attribute of a product is very important as it concerns the user’s ease of using or handling the particular product. There exists a discipline in mechanical engineering called ‘Ergonomics’ that concerns this aspect/attribute of a product. Easy interaction between a product and the user really gives satisfaction to user and he/she become comfortable in operating/using the product. A lack of user-friendliness can be a serious threat to buying the product. This attribute gained its importance due to products from industries like IT, CAD/CAM, Auto, consumer durables etc. This research studies User-friendliness under the Technical Features attributes.
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**Customization**: Another attribute that is important is customization capability of the product. This attribute allows the user to adjust the product to user’s own specific requirements. For example, one can modify the interior of a sedan car/ SUV to suit his/her own requirements. There can be a video screen for passengers on rear seats, or a tray to hold eatables or laptop, like in Airplane for long travels. This attribute is also a very recent phenomenon and attributed to products from industries like Auto, IT, CAD/CAM. This research studies Customization under the Technical Features attributes.

**Expandability**: Attribute is related to product’s capability to grow along with the customer requirements. For example, one may start using CAD software, upgrade to a CAD/CAE product after couple of years. The attribute takes care of customer’s current investment and charges incremental cost for higher capabilities required in future. Most of the IT, CAD/CAM and service industry products provide this capability. This research studies Expandability under the Data Compatibility attributes (as integration capabilities with other software).

**Expertise available in the market**: This attribute plays a vital role in effective usage of the product. Most of the time a product is used for its frequently used capabilities. But at times there are requirements to use additional capabilities. Other examples are maintenance or repair of the product. In all such cases a customer looks for local expert. Non availability of a local expert becomes a drawback of the product. This research studies Expertise Available in the market under the Delivery & Support attributes.

**Data Compatibility**: The importance of this attribute is felt with the advent of IT & related products. Data compatibility refers to the flow of data in a meaningful way from one set of software to the other, horizontally and vertically. For example, data of inventory software should be readable in production, costing and financial software. Data of CAD should be seamlessly available in other CAD (horizontal) CAE, CAM, PLM (vertical) and other special application software (like product planning, quality control software etc). Data Compatibility is been studied in this research under
integration capabilities of software between CAD/CAE/CAM DMS, PLM, & ERP software and with legacy of data and data exchange with vendors, suppliers.

The researcher strongly feels and believes that Data Compatibility of a product is a new attribute assigned to new age products and needs to be included in the studies of Organizational Buying Behavior. Following are the reasons for the same:

- ERP industry has experienced a lot of issues related to data compatibility in the past. Moving away from one ERP software product is not so easy, if the earlier data is not compatible with new one.
- Mobile phone data compatibility is a day-today issue for an individual. Changing mobile phone is very frequent phenomenon. If old data cannot be passed on to new phone, one has to recreate the data in new cell. Apple mobile phone connects through Blue tooth, only to other Apple and to any other mobile phones.
- Today we find various equipment that are linked to each other. A Handy-Cam gets connected to a computer (laptop), Mobile phone, TV, and LCD projector. If the data compatibility is not 100%, then one cannot exchange the data smoothly from one device to another.
- Several applications based on Geographical Information System (GIS), Global Positioning System (GPS), General Packet Radio Service (GPRS) lead to services across the globe. In this Digital Globe, information flow between various devices, software has to be seamless and 100%.

Thus Data Compatibility of products is becoming a very important attribute impacting a Purchase Decision. In the following research, it is studied to establish a relationship between this important attribute of a product, with Purchase Decision.

2.4.1 Attributes under Study

Depending upon the above literature study, the attribute list is been prepared to study under this research. The same is listed and grouped as follows:
I. **Technical Features**: the attribute consist of:

1) Capability to handle free form Curves,
2) Ease of Use- User interface- learning curve,
3) Standard Libraries,
4) Large data handling Capability,
5) Specific area capability: piping/ fabrication/ sheet metal/ Mould/ Die/ Presstool,
6) Customization Capabilities,
7) 2D Drafting Capabilities,
8) Solid Modelling Capabilities

II. **Delivery & Support**: the attribute consist of:

1) Local delivery Channel,
2) Local Support from Channel (Tech Support)- pre & post sales capability,
3) Problem handling/ crisis support- tech Support personnel availability,
4) Local human resources availability with skill on them,
5) Local expertise availability

III. **Price & Commercial**: the attribute consist of:

1) Price per license,
2) Licensing policies- International usage/ Global licensing,
3) Payment Terms,
4) AMC Cost,
5) Support terms on AMC

IV. **Data Compatibility**: the attribute consist of:

1) Foreign Collaboration- Principal Company,
2) Legacy of Data,
3) Data exchange with vendor/ Customer,
4) Integration with CAD/CAM/ CAE,
5) Integration with PLM/ DMS/ ERP

The pilot study will decide whether to keep this list and group &/or make any changes.