

DEPARTMENT OF MANAGEMENT

COURSE TITLE: GENERATION OF REQUIREMENTS

COURSE OUTLINE

Contact hours: 42

Pre-requisites: Introduction to Purchasing and Supply Management

Purpose of the course:

This course is intended to equip learners with tools of generating organizations requirements as a first procurement process. The course introduces the students to various techniques to be employed in generating requirements for organizational needs.

Course objectives:

The following outcomes are expected to be achieved by the end of this course:

- I. develop right purchase descriptions for the organization
- II. Describe how standards are developed for the organization
- III. Make decisions of whether to make or outsource
- IV. Explain the relationship between purchasing and the new product development
- V. Prepare procurement plan

Course Content:

Purchase descriptions and specifications-approaches to balanced specifications; types of specifications; importance of specifications; Role of purchasing in new product development- early supplier and purchasing involvement in design, development and production; Standardization and simplification- implications; industrial and international standards; metric conversion; usefulness of catalogs; Outsourcing and make or buy decisions- strategic and tactical decisions and core competencies; factors influencing make or buy decisions; Developing and managing a buying plan-reactive and proactive purchasing

Teaching / Learning Methodologies: Lectures and tutorials; group discussion; demonstration; Individual assignment; Case studies

Instructional Materials and Equipment: Projector; test books; design catalogues; computer laboratory; design software; simulators

Course Assessment

Examination - 70%; Continuous Assessment Test (CATS) - 20%; Assignments - 10%; Total - 100%

Recommended Text Books:

- i) Arjan Van Weele (2004), *Purchasing And Supply Chain Management*, PVT publishers, New Delhi
- ii) Benton W C (2007), *Purchasing & Supply Management*, Routledge, London

Text Books for further Reading:

- i) Michael Quayle (2005), *Purchasing And Supply Chain Management: Strategies And Realities*, Routledge, London

COURSE CONTENT

TOPIC 1: THE PURCHASE

DESCRIPTIONS *Week one*

1.1 Introduction

1.2 Purchase requisitions/statement of work

1.3 Methods of communicating material needs

Week 2

1.4 Developing the Right Purchase Description

1.5 Classifying an Inventory Catalog

1.6 The Importance of the Purchase Description

1.7 Approaches to Describe What to Purchase (specifications)

Week 3

1.8 The general process of developing the specifications

1.9 Selecting the Right Approach to Describing Requirements

TOPIC 2: STANDARDIZATIONS AND SIMPLIFICATIONS OF MATERIALS AND COMPONENTS

Week 4

2.1 Introduction

2.2 types of standards

Week 5

2.3 method of standardization

2.5 Benefit of standardization

2.6 Roadblock to standardization

TOPIC 3: OUTSOURCING AND MAKE OR BUY

DECISIONS *Week 6*

3.1 Introduction

3.2 Make or buy issues

Week 7 cat 1

Week 8

3.3 Make and Buy decisions

3.5 Reasons for buying or Outsourcing

Week 9

3.6 Types of outsourcing

3.7 Strategic phase of out sourcing

TOPIC 4: THE PURCHASING AND NEW PRODUCT

DEVELOPMENT *Week 10*

4.1 Introduction

4.2 The process of new product development

4.3 communications between buyers and first tier suppliers

4.4 benefits of early supplier involvement

TOPIC 5: THE PROCUREMENT PLAN

Week 11

5.1 Introduction

5.2 Procurement Plan?

5.3 Importance of procurement plan

5.4 Strategic purchasing plan

Week 12

5.5 MATERIALS PLANNING

5.6 Purchasing and Materials planning

5.7 TECHNIQUES OF MATERIALS PLANNING

Week 13

5.8 SOME GUIDELINES FOR MATERIALS PLANNING

5.9 MATERIALS BUDGETING

5.10 Materials budgeting and accounting

REFERENCES

- i) Gopalakrishnan P(1994)Handbook of Material Management,Prentice Hall,India
- ii) Arjan Van Weele (2004), *Purchasing and Supply Chain Management*, PVT publishers, New Delhi
- iii) Benton W C (2007), *Purchasing and Supply Management*, Routledge, London
- iv) Michael Quayle (2005), *Purchasing and Supply Chain Management: Strategies And Realities*, Routledge, London
- v) Saleemi,N.A, stock control Saleemi publishers ,Nairobi
- vi) Handfield, R., Ragatz, G., Petersen, K., Monczka, R. (1999). *Involving suppliers in new product development. California Management Review.*
- vii) Lakemond, N. Echtelt, F, and Wynstra, F. (Fall, 2001). *A configuration typology for involving purchasing specialists in product development. The Journal of Supply Chain Management.*

TABLE OF CONTENTS

COURSE OUTLINE	2
CHAPTER ONE	9
THE PURCHASE DESCRIPTIONS	9
1.1 INTRODUCTION	9
1.2 PURCHASE REQUISITIONS/STATEMENT OF WORK	10
1.3 METHODS OF COMMUNICATING MATERIAL NEEDS	12
1.4 DEVELOPING THE RIGHT PURCHASE DESCRIPTION	15
1.5 CLASSIFYING AN INVENTORY CATALOG	16
1.6 THE IMPORTANCE OF THE PURCHASE DESCRIPTION	17
1.7 APPROACHES TO DESCRIBE WHAT TO PURCHASE (SPECIFICATIONS)	19
1.8 THE GENERAL PROCESS OF DEVELOPING THE SPECIFICATIONS	25
1.9 SELECTING THE RIGHT APPROACH TO DESCRIBING REQUIREMENTS	29
CHAPTER TWO	32
STANDARDIZATIONS AND SIMPLIFICATIONS OF MATERIALS AND COMPONENTS	
32	
2.1 INTRODUCTION	32
2.2 TYPES OF STANDARDS	33
2.3 METHOD OF STANDARDIZATION	36
2.4 SIMPLIFICATION	37
2.5 BENEFIT OF STANDARDIZATION	38
2.6 ROADBLOCK TO STANDARDIZATION	39
CHAPTER THREE	42
OUTSOURCING AND MAKE OR BUY DECISIONS	42
3.1 INTRODUCTION	42
3.2 MAKE OR BUY ISSUES	43

3.3 MAKE AND BUY	56
3.4 OUTSOURCING	58
3.5 REASONS FOR BUYING OR OUTSOURCING	58
3.6 TYPES OF OUTSOURCING	60
3.7 STRATEGIC PHASE	62
CHAPTER FOUR	69
THE PURCHASING AND NEW PRODUCT DEVELOPMENT	69
4.1 INTRODUCTION	69
4.2 THE PROCESS OF NEW PRODUCT DEVELOPMENT	69
4.3 COMMUNICATIONS BETWEEN BUYERS AND FIRST TIER SUPPLIERS	71
4.4 BENEFITS OF EARLY SUPPLIER INVOLVEMENT	71
CHAPTER FIVE	74
THE PROCUREMENT PLAN	74
5.1 INTRODUCTION	74
5.2 WHAT IS A PROCUREMENT PLAN?.....	75
5.3 IMPORTANCE OF PROCUREMENT PLAN.....	75
THE PROCUREMENT PLAN HELPS TO:	75
5.4 STRATEGIC PURCHASING PLAN.....	76
5.5 MATERIALS PLANNING.....	79
5.6 PURCHASING AND MATERIALS PLANNING	81
5.7 TECHNIQUES OF MATERIALS PLANNING.....	82
5.8 SOME GUIDELINES FOR MATERIALS PLANNING	86
5.9 MATERIALS BUDGETING	87
5.10 MATERIALS BUDGETING AND ACCOUNTING.....	89
SAMPLE PAPERS.....	97

CHAPTER ONE

THE PURCHASE DESCRIPTIONS



Learning Objectives

By the end of this chapter the learner should be able to:

- a) Identify the components of purchase descriptions*
- b) Describe the purchase descriptions flow*
- c) Explain methods of communicating material needs*
- d) Describe how to develop good purchasing descriptions*
- e) Discuss various approaches to specifications*
- f) Describe the general process of developing specifications*

1.1 Introduction

Determining what materials and services to purchase is the first and one of the most crucial steps in the procurement process. Responsibility for this determination varies with the requirement. In many cases, the using department is responsible. For example, Plant Engineering is responsible for developing equipment requirements. Plant Operations develops requirements for operating supplies such as drill bits, lubricating oils, and related items. Administrative Services initiates requirements for office supplies, equipment, and services.

The responsibility for determining which component materials to specify for newly designed products is a complex issue, complicated by the frequently conflicting interests, orientations, and biases of the many departments that have an interest in the end item or service. For example, Engineering may desire design excellence. Marketing may demand nonstandard and unique features. Operations prefers long production runs utilizing existing equipment, requiring few operators, and using high-quality, easy-to-work materials. Purchasing prefers to buy readily available materials from several dependable sources at reasonable prices.

Historically, Purchasing contributions to the organization's success have been seen as being in two basic areas:

- ensuring the timely availability of required supplies and services
- and Obtaining them at economic prices.

However, these contributions are greatly expanded when purchasing is included at the beginning of the design process. For instance, as material requirements are developed, purchasing should ensure that only essential needs are incorporated in the requirement. The description of the requirement (usually a specification) should not contain features that unduly limit competition among qualified suppliers. Further, purchasing can help the designer to be sensitive to the relative availability and cost of the alternative materials that may satisfy product requirements. Timely availability of required materials and services usually is enhanced by the availability of two or more qualified sources or carefully structured strategic alliances.

1.2 Purchase requisitions/statement of work

The most common method of informing purchasing of material needs is through a purchase requisition. Users may also transmit their needs by phone, by word of mouth or through a computer generated method.

Although there are a variety of purchase requisition formats, every requisition should contain the following;

Description of required material or service

Quantity and date required

Estimated unit cost

Operating account to be charged

Date of requisition (this starts the tracking cycle)

Date required

Authorized signature

Although varieties of formats exist, at a minimum a purchase requisition should include a detailed description of the material or service, the quantity, date required, estimated cost and authorization. This form of communication for a specific need is called a requisition. A requisition is an electronic or paper form that provides some critical information about the need. A typical requisition will provide a description of the product (e.g a valve) the material and color (brass, red

valve), the quantity required (20 red brass valves), the intended purpose (20 red brass valves to be used in a maintenance project for equipment XYZ) and the required date for delivery (three weeks).

Sometimes a service is required. For instance, marketing may want to purchase an advertising campaign R & D may need a clinical trial or human resources may need to print a brochure. In this case, the user will complete a statement of work (SOW) that specifies the work that is to be completed, when it is need and what type of service provider is required.

A standard purchase requisition or SOW is used most often for routine, noncomplex items that are increasingly being transmitted through online requisitioning systems linking users with purchasing. An online requisition system is an internal system designed primarily to save time through efficient communication and tracking of material requests. Users should use these systems only if they require purchasing involvement. It is possible that users have access to other systems that will allow them to purchase an item directly from a supplier such as corporate procurement card. In that ease requisitions forwarded to purchasing are unnecessary.

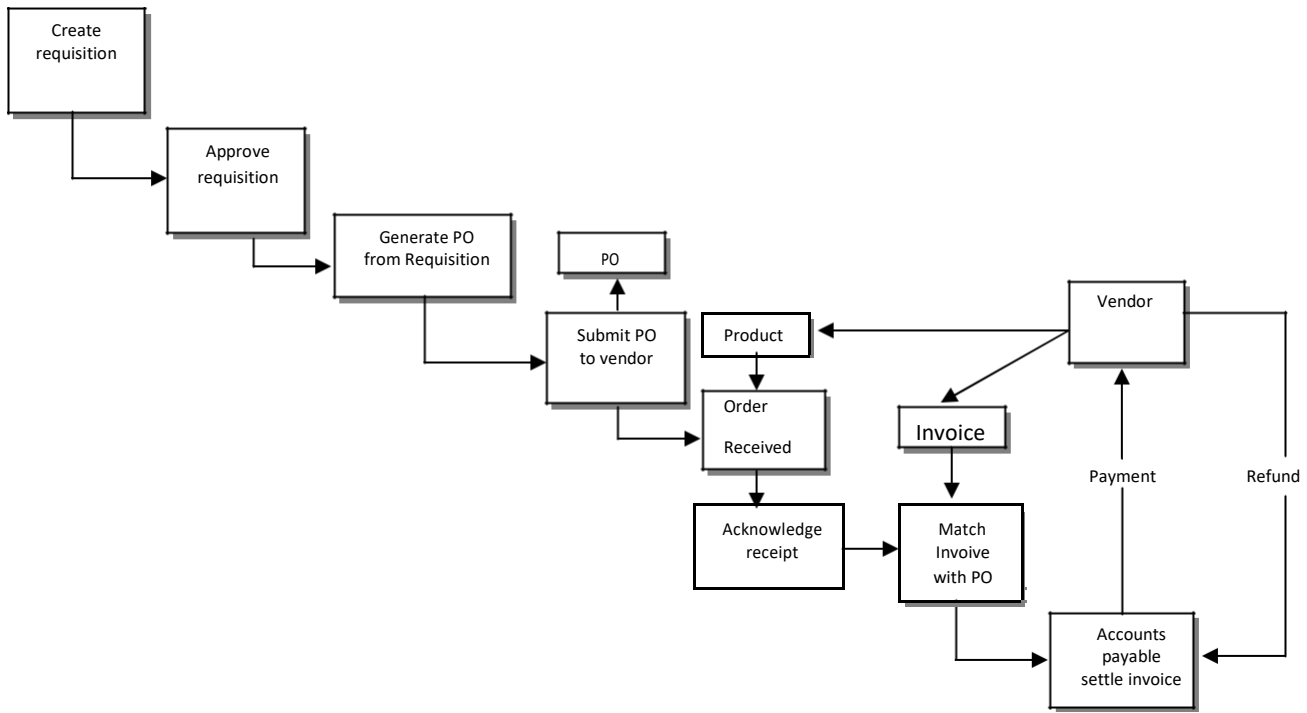
There are wide differences across organizations in the quality and use of electronic purchase requisition systems. A system that simply requires users to submit to purchasing what they require for electronic transmission is similar to electronic mail. This type of system provides little added value except to speed the request to purchasing. Conversely, one system was so complex that users were afraid to use it.

This type of system provides little added value except to speed the request to purchase.

They bypassed online requisitioning and relied instead on the phone or intracompany mail.

Exhibit 1.2.1 provides further details regarding how a purchase requisition is approved, converted into a purchase order, and ultimately prepared for delivery and payment. Although the user may suggest a supplier, purchasing has final selection authority.

Exhibit 1.2.1: Purchase Requisition Flow



For routine, off the shelf items, the requisition may contain all the information that purchasing requires. However, for technically complex or nonstandard items, Purchasing may require additional information or specifications with the requisition. Examples of such specifications include the grade of material method of manufacture and detailed measurements and tolerance. Purchasing may send an acknowledgment of the receipt of the purchase requisition to the requestor. This acknowledgment often takes the form of a confirming order requisition. The acknowledgement may be a separate form notifying the user that purchasing has received and is processing the requisition, or it may be a copy of the original requisition. The confirmation verifies the accuracy of the user's material request.

1.3 Methods of communicating material needs

There are various ways of communicating material needs, namely

1.3.1 Travelling purchase Requisitions/Bar Code

Materials needs are also communicated through a travelling purchase requisition – a form consisting of a printed card or a bar code with information about whom the item is purchased from.

This method is used primarily for very small companies that have not automated their purchasing or inventory management process. Information on the card or the database entry associated with the bar code can include the following;

- Description of item

 - List of approved suppliers

 - Prices paid to suppliers

 - Reorder points

- Record of usage

A travelling requisition can be helpful because it can conserve time when reordering routine materials and supplies. When stock levels reach a specific reorder point an employee notifies purchasing by forwarding the traveling requisition maintained with the inventory or by electronically scanning the bar code into the ordering system. The employee notes the current stock level and desired delivery date. To eliminate the need to research information, the travelling requisition includes information required for the item on the card (or in the data base) that otherwise would require research by a buyer. For example the travelling requisition can include a list of approved suppliers, prices, a history of usage and ordering and lead time information. Historical ordering information is noted directly on the record over a period of time. As inventory systems are used less frequently. With an automated system, clerks simply enter the order requirement and the system generates a purchase requisition or automatically places an order.

1.3.2 Forecast and Customer Order

Customer orders can trigger a need for material requirements, particularly when changes to existing products require new components. Customer order can also signal the need to obtain existing materials. As companies increasingly customize products to meet the needs of individual customers, purchasing must be ready to support new material requirements. Market forecast can also signal the need for material. An increasing product forecast, for example, may signal the need for additional or new material. If a supplier is already selected to provide that material, then an automated ordering system such as material requirements planning (MRP) systems may forward the material request to suppliers automatically.

1.3.3 Reorder Point System

A reorder point system is a widely used way to identify purchase needs. Such a system uses information regarding order quantity and demand forecast unique to each item or part number maintained in inventory. Each item in a reorder point system, which is usually computerized, has a predetermined order point and order quantity. When inventory is depleted to a given level the system notifies the materials control department (or the buyer, in some organizations) to issue a request to a supplier for inventory replenishment. This signal might be a blinking light on a screen, a message sent to the materials control department's e-mail address, or a computer report. Most reorder point systems are automated using predetermined ordering parameters (such as an economic order quantity, which considers inventory holding and order).

Most reorder point systems are automated using predetermined ordering parameters (such as an economic order quantity, which consider inventory holding and ordering costs). Electronic systems (such as material requirements planning systems) can instantly calculate reorder point parameters. Most systems can also calculate the cost tradeoffs between inventory holding costs, ordering cost and forecast demand requirements. Reorder point systems are used for production and nonproduction items.

An automated reorder point system efficiently identifies purchase requirements. This type of system can routinely provide visibility to current inventory levels and requirement of thousands of parts number. The reorder point system is the most common method for transmitting routine material order requests today, particularly for companies that maintain spare part distribution centers.

1.3.4 Stock Checks

Stock checks (or cycle counts) involve the physical checking of inventory to verify that system records (also called the record on hand, or ROH) match actual on hand inventory levels also called the physical on-hand (POH) levels. If the physical inventory for an item is below the system amount, an adjustment to that part record can trigger a reorder request for additional inventory. Why might physical inventory be less than what the computerized system indicates should be on hand? Placing material in an incorrect location, damage that is not properly recorded, theft and short shipments from the supplier that receiving did not notice all can contribute to the POH being less than the ROH for example, at one major hardware retailer, missing inventory on the shelf

may be located in another area of the store, or may simply be missing because of a problem with the incorrect item being entered into the system.

Smaller firms that rely on standard, easy-to-obtain items often use stock checks to determine material ordering requirements. In this environment, the stock check consists of physically visiting a part location to determine if there is enough inventories to satisfy user requirements. No purchase reorder is necessary if there is enough inventories to satisfy user requirements. No purchase reorder is necessary if there are enough inventories to cover expected requirements.

1.3.5 Cross-functional New-Product Development Teams

When users contact purchasing with a specific need, we say that purchasing is operating in a reactive manner. When purchasing works directly with internal customers to anticipate future requirements, such as during new product development purchasing is being proactive. What does it mean to anticipate a requirement? If purchasing is part of new product development teams, then the opportunity exists to see product designs at early stages of the process. Purchasing can begin to identify potential suppliers for expected requirements rather than reacting to an engineering requirements at a later date anticipating requirements can contribute to faster products development cycle times and better supplier evaluation and selection. As firms continue to be forced to reduce the time required to develop new products cross-functional interactions will increasingly be the means through which organizations identify, and hopefully anticipate, materials requirements in the purchasing process cycle.

However the need is clarified, the point here is that a requisition document is completed by requisitioner. A requisitioner is someone who is authorized by purchasing to complete the needs clarification process. In some cases, the person who expresses the need can also be the requisitioner. This occurs in case where the supplier has already been qualified, and the individual who has the need can go to a supplier's online catalogue, order the product or service directly and pay for the item using a company purchasing credit card. In such cases, the item is typically low cost, and it is not worth the expense and trouble completing an entire requisition.

1.4 Developing the Right Purchase Description

Within the requisitioning, it is important to include a description of what is to be sourced.

Why? If the time is not spent to describe the product or service purchasing will have no idea of what to go out and purchase! How purchasing accomplishes this will defer dramatically from one situation to the next.

There are two main problems common in the area of purchase descriptions:

Requiring activities frequently fail to consider the cost implications of alternative proaches to describing their requirements.

Purchasing departments often fail to conduct systematic procurement research and analysis on alternate materials when appropriate.

The word *requirement* means "need," not product or service type, which is a solution to a need. All purchasing starts with need determination, and this process eventually is translated into products or services, which then direct us to potential suppliers and the cost of the solution. Under appropriate circumstances, need determination may include carefully screened suppliers. Jumping to a product skips the essential first step of identifying alternatives and can result in automatic supplier selection, locked-in high costs, mistakes causing very expensive change orders, and users doing the buying-all potentially uneconomical actions. For example, if the need is to join two pieces of material together, we can weld, bolt, glue, screw, or use other methods to *fasten*, that is, the need is to "fasten together" and the requirement determination process is which method, then which product, then which supplier.

This kind of thinking also forces the investigation of new methods and helps prevent the continued use of obsolete products/procedures.

1.5 Classifying an Inventory Catalog

An inventory catalog should be coded according to several classifications, easily done today with computer data systems. A few classic classifications are:

1. Buying-Using Experience. Is the product/service a new buy, modified rebuy (same product type, slightly different need), or straight rebuy? This will determine the amount of effort needed to determine the requirement. Most of the straight rebuys are via systems contracts, electronic data interchange (EDI), and such; they should be "automated" with requirements changed as the need

dictates.

2. *Value-Volume Relationships*. This is the familiar ABC inventory analysis, which usually starts with a finding that A items account for 80% of the dollars spent but represent just 20% of the physical volume, B items represent 15% of the dollars spent for 30% of the physical volume, and C items represent 5% of the dollars for 50% of the physical volume. This traditional analysis targets candidates for special study. Critical items that can shut the operation down also qualify as A items. Requirements for A items are obviously the top priority, for they are the real cost drivers.

3. *Type of Product or Service*. Capital goods, especially production machine tools, call for a vastly different requirement determination than most raw materials or maintenance, repair, and operating (MRO) supplies.

Coding your inventory catalog according to the above classifications have the following advantages:

- facilitate rapid computer

- printouts to give direction to purchasing research assignments.

It helps the purchasing department focus activities to achieve the highest payoff.

It also helps to explore the questions of simplification and standardization to avoid too many unnecessary requirements and/or slight variations adding little or nothing to value.

Serving a medium of communication by enabling staff to tell which items are carried in the inventory, whether interchangeable items are carried in the inventory for missing items . etc

Acting as an inventory control tool through reduction of duplicate records for identified parts.

1.6 The Importance of the Purchase Description

Once the buyer has known the need, he or she can now write the purchase description that forms the heart of any procurement.the process of describing purchase is known as specification. specification can be defined as a statement of needs. It defines what the purchaser wants to buy and, consequently, what the supplier is required to provide. Specifications can be simple or complex depending on the need.

The success of the purchasing activity relies on the specification being a true and accurate statement of the buyer's requirements.

Apart from being a means of identifying the goods or services required, a specification will form part of any future contract that might result from offers received.

The specification forms part of an "*Invitation to Offer*" document. Other elements in the invitation document include the "Conditions of Offer", the "Conditions of Arrangement/Supply/Contract" and "Form of Offer" and response schedules.

Good specifications should:

- state the requirement clearly, concisely and logically in functional and performance terms unless specific technical requirements are needed;
- for goods, state what the item will be used for;
- contain enough information for offerors to decide and cost the goods or services they will offer and at what level of quality;
- permit offered goods or services to be evaluated against defined criteria by examination, trial, test or documentation;
- state the criteria for acceptance of goods or services by examination, trial, test or documentation;
- provide equal opportunity for all potential suppliers to offer goods or services which satisfies the needs of the user, including goods or services incorporating alternative solutions;
- form the fundamental basis of the contract between buyer and seller;
- not over-specify requirements; and
- not contain features that directly or indirectly discriminate against any suppliers

Whether a purchase order or contract will be performed to the satisfaction of the buyer frequently is determined at the time the purchase description is selected or written. In no other form of communication is there a greater need for clarity and precision of expression. The extent of this precision has a major bearing on the successful completion of the procurement.

Purchase descriptions serve a number of purposes. Some of these are used to do the following:

- * Communicate to the buyer in the purchasing department what to buy
- * Communicate to prospective suppliers what is required.
- * Serve as the heart of the resulting purchase order.
- * Establish the standard against which inspections, tests, and quality checks are made.

The purchase description can greatly influence the amount of competition. The amount of competition has a major impact on the purchase price. The type of purchase description also may affect the "depth" of competition: This depth of competition may have an even more pronounced effect on the purchase price.

1.7 Approaches to Describe What to Purchase (specifications)

a) Brand or Trade Name

The use of a brand name is the simplest way to describe what to purchase. A brand name is used by a manufacturer to distinguish a product and to aid in its promotion. Brand names ensure that the goodwill developed in satisfied customers is credited to the product. Such goodwill requires that the manufacturer provide consistent quality. Using a brand name description implies a reliance on the integrity and the reputation of the manufacturer. When purchasing by brand name, the purchaser has every right to expect that follow-on purchases of the brand name will possess the same quality as the original.

Normally the expression "or equal" should be used immediately following a brand name to facilitate competition. When using an "or equal" after a brand name, it is desirable to set forth those salient physical, functional, or other characteristics of the referenced product that are essential to the purchaser's needs. The term *or equal* means that any proposed item should be able to perform the function to the same level of satisfaction as does the specified brand.

Although the use of brand names simplifies the procurement process, it tends to be expensive. Even when competition is introduced through the use of the "or equal" provision, higher prices tend to result than when several of the alternative descriptions of the item are employed. Brand-name products generally are sold at higher prices than unbranded products of similar quality. There are several advantages and disadvantages in specifying brand names.

Advantages

- * Describing the desired item is simple for the requiring department.
- * Purchasing by brand name is relatively simple.
- * Brand-name products tend to be more readily available than unbranded items.
- * The use of a brand-name purchase description may be the most efficient method of obtaining a desired level of quality or skill when this level of quality cannot be defined easily.

- * The branded item may be advertised so widely and successfully as to aid in promotion of the product in which it will be incorporated.
- * Inspection of brand-name items is relatively simple.
- * Testing of an item may be impractical. The purchaser may avoid such testing by relying on the brand-name manufacturer's quality standards and test reports.
- * The purchaser is assured that the manufacturer will stand behind his or her brand-name product.

Disadvantages

- * Brand-name products usually cost more.
- * Using brand-name products may mean that the purchaser is not taking advantage of improvements introduced by competitors of the brand-name manufacturer.
- * The use of the "or equal" provision may mean that items are purchased from a variety of manufacturers. Since each manufacturer exercises its own quality control, the quality variation probably will be larger than if the item were purchased from one source only or purchased by detailed specification. When commonality of items from purchase to purchase is essential, the use of "or equal" is not desirable.

b) Samples

The need to develop a purchase description sometimes is avoided through the use of samples. Prospective suppliers are invited to match or duplicate the buyer's sample. Such an approach may be appropriate when special, nonrepetitive items are to be purchased and quality requirements are not a significant factor.

Advantage

- * Use of samples is a very simple method of communicating what is required.
- * It is almost mandatory when purchasing materials requiring a specific color, feel, finish, or look, such as painted printed surfaces, fabric, style, film, packaging, signs, letterhead stationary, and the like.

Disadvantages

- * Detailed tests and inspections may be required to determine that the furnished item meets the sample.
- * The inspection on a requirement such as color may be very subjective.

*No definite standards are established either for record-keeping purposes or as the basis of future purchases.

*If the sample is exactly reproduced, all performance warranty responsibilities shift to the buyer as the supplier has performed as per the instructions from the buyer.

c) Standard Specifications

Recurring needs for a consistent level of quality have led industry and government to develop standard specifications for many items. Standard specifications include commercial standards, country specifications, and international specifications. Such standard specifications contain descriptions of the quality of materials and the quality of workmanship to be used in manufacturing the item. Testing procedures are included to ensure that those quality standards are met.

Advantages

*The use of standard specifications greatly facilitates communications. The requirer, purchaser, and supplier all know what is needed.

* The cost of developing a design specification is avoided.

* The use of standard specifications results in wider competition and lower prices.

*The use of standard specifications facilitates the firm's standardization program, resulting in savings in purchase price, inspection, materials handling, and inventory carrying costs.

* Standardized items tend to be more readily available.

* Designs developed by professional societies are often state of the art and thoroughly tested.

Disadvantages

*Standard specifications may be dated. Accordingly, the buyer may not be taking advantage of the latest technology.

* The specification may call for inputs or processes that are difficult or expensive to achieve.

*Testing costs might be higher than with brand-name products, as there is less performance history.

* As with samples, responsibility for the suitability of the purchased item rests with the purchaser. Normally, the supplier who produces under a specification cited in a purchase order is not responsible for ensuring that the item will satisfy the customer's need. (With a performance specification, this responsibility is shifted to the supplier.)

* The use of standard specifications results in the purchase of standardized items. The incorporation of such standardized items in the purchaser's end product may conflict with marketing's desire to sell a unique product.

d) Design Specifications

Design specifications* spell out in detail the materials to be used, their sizes, shapes, and tolerances, exact physical and chemical characteristics, and how the item is to be fabricated. They provide a completely defined item capable of manufacture by a competent manufacturer. They also describe test procedures to be used to verify that all stated requirements have been met. The specification must meet the requirements of many departments in the firm: Engineering's concern for technical adequacy, Marketing's concern with consumer acceptance, Manufacturing's concern for ease of production, and Purchasing's concern for availability and economy. As would be expected, design specifications often use commercial standards and other standard specifications.

Since design specifications frequently are the basis of competitive bidding, they must communicate what is needed without need for further clarification. Thus, critical dimensions must be spelled out in detail, and all necessary quality requirements must be fully described. Concomitantly the specification must avoid imposing unnecessary conditions that would disqualify an otherwise acceptable product because it fails to meet a nonessential condition. The design specification must convey a complete and accurate understanding of what is required. The same word or expression is subject to different interpretations by different people. The supplier will interpret the specification to its own advantage.

A specification essentially is the means of transferring knowledge between minds. Each mind will test the words of a specification against its own experience. If the design specification is ambiguous, the ambiguity will be construed against. Blueprints and engineering drawings are included under the heading of design specifications. Blueprints and drawings should include a statement of function.

When design specifications control performance under a purchase order or a contract, there is a presumption that the specifications are adequate for the purposes intended and that, if followed, the desired outcome will be obtained. There is an implied warranty that the specifications are

adequate. Thus, the supplier who produces under the customer's specification is not responsible for the suitability or acceptability of the resulting product. However, if the supplier knows (or perhaps from experience should know) that the desired product cannot be obtained, it cannot make a useless thing and expect to be paid for it. If the supplier knows (or should have known) that the specification is defective, it is obligated to notify the customer of the defect. The supplier discharges this obligation by making the defect known to the customer.

As might be expected, design specifications must be reviewed periodically and updated. Unfortunately, the use of design specifications tends to complicate purchase order administration (follow-up and expediting) and may increase costs, delay delivery result in delivery of obsolete items, and sharply increase inventory carrying costs. The use of design specifications may create a costly storage and distribution system for items that are not generally commercially available.

There are several advantages and disadvantages in using design specifications.

Advantages

- *The purchasing organization avoids having to purchase on a sole-source basis. savings can be enjoyed by avoiding sole-source situations.
- * The purchasing organization avoids paying premium prices on branded goods.
- *Design specifications facilitate the corporate standardization program, and many savings are enjoyed through such a program.
- * They can solve the problem of "no supplier can design it," if true.

Disadvantages

- * Design specifications are expensive to develop. Both time and human resources are required.
- *The purchaser is responsible for the adequacy of the specification and the buying firm may use obsolete technology.
- * The use of design specifications may deny the purchaser the latest advances in both technical development and manufacturing processes.
- * Using a design specification for material that is very similar to an item covered by a commercial standard may result in higher unit prices. Further, the item covered by the design specification will tend to be less readily available.
- * The use of design specifications restricts competition to one approach or concept. As we have seen, competition of concepts resulting from use of a performance specification may lead to

significant financial and time savings.

*Purchase through the use of design specifications tends to complicate the purchase order administration function. Late delivery of unique items is much more common than it is for standard ones.

* The purchaser usually assumes the inventory responsibility for such unique items.

e) Performance Specifications

Performance specifications generally describe a product by its capacity, function, or operation instead of by its physical, chemical, or quality characteristics. The supplier need only demonstrate acceptable performance to achieve acceptance of the product.

A performance specification provides a description of the intended use of an item (whether component, plant, or equipment). A performance specification may include a statement of the qualitative nature of the item required. When necessary, it may set forth those minimum essential characteristics and standards to which such item must conform to satisfy its intended use.

Performance specifications describe in words what the item is to do instead of describing the item in terms of its physical and chemical properties.

Although a performance specification is much shorter and easier to develop than a design specification, caution must be exercised in its development. Once again, engineering, marketing, manufacturing, and purchasing requirements must be considered.

The following general principles apply to the development of performance specifications:

* The performance specification must not be so narrow that it stifles creativity.

*While unnecessarily restrictive performance specifications are undesirable, the performance specification must be sufficiently specific to obtain desired objectives. If it is written too broadly, potential suppliers may choose not to respond because of the uncertainty and risk involved, their inability to relate work requirements to their talents and capabilities, or difficulties in estimating costs.

* The performance specification serves as the nucleus of the purchase order or contract. The

resulting performance is a direct function of the quality, clarity, and completeness of the specification.

* The element of risk to the supplier inherent in producing under the performance specification should affect the type of pricing on the resulting purchase order (e.g., firm fixed price, fixed-price incentive).

As with other approaches to defining and communicating the requirement, the use of performance specifications has inherent advantages and disadvantages.

Advantages

* Performance specifications are relatively easy to prepare.

* Their use tends to avail the purchaser of the latest technology.

* Using performance specifications ensures that the purchaser obtains the specified (desired) level of quality.

* When several already designed, developed, and produced items can meet the performance specification, the depth of competition is enhanced and purchase costs are reduced.

* Performance specifications allow a greater degree of innovation by suppliers. Under performance specifications, the supplier assumes the responsibility of providing a product suitable to the purchaser's need.

Disadvantages

* Marginal suppliers look for loopholes in specifications. Care and effort must be taken to screen potential suppliers to ensure that only reputable ones are asked to submit proposals. The use of performance specifications is restricted by purchasing's ability to select capable and ethical suppliers-the kind who do not look for loopholes.

* Competition tends to be reduced when the performance specification requires potential suppliers to perform considerable engineering in preparation for submitting a bid or proposal. Reduced competition may result in higher prices.

1.8 The general process of developing the specifications

Step 1: planning and analysis

The foundation of a good specification is in the planning and analyses which are undertaken before writing begins. Key people who can help such as purchasing staff, technical officers, project officers and managers and end users need to be involved. Planning and analysis will provide a better understanding of the requirement(s) and may reveal alternative solutions.

Planning and analysis are particularly important when developing complex requirements. These may take some time to define, perhaps even years in the case of major equipment. The accuracy and detail of the definition is likely to improve as information is gathered and assimilated.

Define the requirement(s) and then approach industry to see what is available to meet the department's/agency's needs. If industry is approached too early in the development process, there is the risk of deciding the solution to the problem before the requirement(s) is fully defined.

In some cases potential solutions may be discovered and explored which may allow refinement of needs. Think in terms of the performance required or the functions to be performed. In other cases, however, solutions may not be readily available or there could be the danger in stating a solution up front that may restrict offers of alternative solutions. In this situation, a full explanation of the issue or problem is needed.

Breaking down the requirement(s) in terms of function and performance will better define the need. Defining the requirement(s) in terms of the lowest level functions or sub components should also help to discover conflicts and inconsistencies within the requirement(s). Alternative solutions, too, may be revealed in the process.

Value analysis could be used to highlight and explore possible solutions. It is a complex cost analysis technique that requires expertise for its successful use. In simple terms, *value analysis* looks for the optimum way of using materials, designs, equipment etc. to meet a (functional) requirement while providing savings over the life of the equipment or at the initial purchase stage. The technique is particularly useful in identifying potential, innovative solutions.

Step 2: Consultations and information gathering

Developing specifications requires consultation and can be perceived as an evolutionary process involving close and continuous liaison between the end-user, technical officers, project officers/managers, purchasing officers and the specification writer.

Valuable information and advice relating to the requirement can be obtained by discussing it with purchasing officers, technical officers and other users of similar goods or services within the department/agency. Purchasing officers should be involved from the start of the process (that is, the information gathering and design stages).

Other sources of information include:

- other departments or agencies (including Federal and Local Governments);
- industry - either industry associations or particular companies (ensure that industry does not assume pre-offer negotiations);
- educational institutions, for example, universities and TAFE Institutes;
- Country standards;
- Industrial Supplies Office Ltd (ISO Queensland) which can assist in identifying and evaluating appropriate local industry capabilities; and
- other users of the goods or services.

These organizations may help to refine the requirement and also suggest potential solutions.

Step 3: writing specifications

- Use simple, clear language without jargon (to minimize misinterpretation).
- Define terms, symbols and acronyms (include a “Glossary of Terms”).
- Be concise.
- Do not explain the same requirement in more than one section.
- Define each aspect of the requirement in one or two paragraphs where possible.
- Adopt a user-friendly format.
- Number the sections and paragraphs.
- Seek feedback from someone unfamiliar with the requirement.
- Discuss the draft and refine it.

There are no fixed rules on formats and structures because each specification reflects a different requirement or need. A specification should list the functional, performance and technical characteristics separately.

Refine the structure before writing by discussing with colleagues and purchasing officers. Include tables, sketches, diagrams, or statistical matter if these help to make the specification clearer. Be

careful that these types of information do not limit the options for offerors to provide alternative solutions.

Step 4: Vetting specifications and obtaining approval

After writing the specification, ask a colleague who is unfamiliar with the requirement to critique it from a potential supplier's view.

Try to identify improvements by considering:

- readability,
- simplicity of meaning,
- clarity, and
- logic.

Seek approval from the appropriate financial or purchasing delegates in the department/agency after vetting the specification but before issuing it.

Step 5: issuing the specifications

The specification should be included as part of the *“Invitation to Offer”* document. The “Invitation to Offer” should target suppliers that are capable of meeting the specification by direct approach (after market analysis) or through advertising in newspapers, websites and industry magazines, etc.

Step 6: managing amendments to the specifications

Should a need arise to amend the specification during the “Invitation to Offer” process, the amendment should be authorized by the project manager. The amended specification should be noted in the project files and all offerors or potential offerors must be given a reasonable opportunity to offer to the new specification.

Step 7: Revising and storing the specifications

The specification should be reviewed at the end of the purchasing activity to ensure that it effectively defined the goods or services that were actually bought. If areas for improvement are identified, revise the specification with the benefit of hindsight.

When the review of the specification has been completed and if it relates to goods or services that are likely to be purchased frequently, keep it on file. Before each purchase, review the specification to ensure that it reflects your department's/agency's needs at that time. Alternatively, institute a program to review specifications on a regular basis.

1.9 Selecting the Right Approach to Describing Requirements

Although the decision on what type of purchase description to use may appear to be simple, many factors complicate the issue. For small, noncritical procurements, brand names or samples frequently best describe requirements. The use of a brand name as a purchase description is appropriate to:

Obtain the desired level of quality or skill when these are not described easily,

Gain the benefits of wide advertising of the brand-name item that would aid in promotion of the purchaser's end product,

Accommodate users who have a bias or prejudice (whether founded or unfounded) in favor of the brand. Such prejudices can be virtually impossible to overcome.

When brand names or samples are inappropriate for describing requirements, some type of specification is employed. When selecting or developing the specification, consideration must be given to the importance of competition and the desirability of avoiding unnecessarily restrictive criteria.

Once a need has been identified and functionally described, and when the size of the contemplated purchase warrants, procurement research and analysis should be conducted to investigate the availability of commercial products able to meet the company's need. Normally, these commercial products are described by one of the standard specifications. This research and analysis also should provide information to aid in selecting a procurement strategy appropriate to the situation. Procurement research and analysis involves obtaining the following information as appropriate:

- * The availability of products suitable to meet the need (with or without modification)
- * The terms, conditions, and prices under which such products are sold

- * Any applicable trade provisions or restrictions or controlling laws
- * The performance characteristics and quality of available products, including quality control and test procedures followed by the manufacturers
- * Information on the satisfaction of other users having similar needs
- * Any costs or problems associated with integrating the item with those currently used
- * Industry production practices, such as continuous, periodic, or batch production
- * The distribution and support capabilities of potential suppliers

If a suitable commercial product is unavailable at a reasonable price, a determination should be made on whether to use a design or a performance specification.

Summary

Once the need or required function is determined, the purchase description forms the heart of the procurement. The organization's satisfaction with the purchased item frequently is determined at the time the purchase description is selected or developed. Purchase descriptions communicate to the buyer what to purchase, communicate to prospective suppliers what is required, serve as the principal element of the resulting purchase order or contract, and establish standards for inspection. Five types of purchase descriptions have been described: brand or trade names, samples, standard specifications, design specifications, and performance specifications. Each has inherent advantages and disadvantages; no one approach is right or best in all circumstances.



Review Questions

- i) *Define the following terms:*
 - a) *Purchase descriptions*
 - b) *Purchase requisitions or statements of work*
- ii) *Describe the purchase descriptions flow*
- iii) *Discuss various methods used in communicating material needs*
- iv) *explain how good purchasing descriptions are developed*
what are the various approaches to specifications
- v) *Describe the general process of developing specifications*

Suggested Further Readings

- i) Arjan Van Weele (2004), *Purchasing and Supply Chain Management*, PVT publishers, New Delhi
- ii) Benton W C (2007), *Purchasing and Supply Management*, Routledge, London

CHAPTER TWO

STANDARDIZATIONS AND SIMPLIFICATIONS OF MATERIALS AND COMPONENTS



Learning Objectives

By the end of this chapter the learner should be able to:

- a) Define the following
terms: Standards
Simplifications*
- b) Explain various types of standards classifications*
- c) Identify items to be standardized*
- d) Discuss the importance of standardizations and simplifications*
- e) Explain the methods of standardization*
- f) Discuss how simplifications are achieved*

2.1 Introduction

A standard is defined as a model or general agreement or a rule established by authority, consensus, or custom, created and used by various level of interest.

Standardization is the orderly and systematic formulation, adoption, application and review of industrial standard which lead to simplification or variety reduction.

This implies reducing unnecessary varieties and standardizing to the most economical sizes, grades, shapes, colour or types of parts. The word “standard” is multivalued as it may means physical standard prototype of mass or a technical document. Industrial standard s is the generally accepted statement of the requirement.

Standardization eliminates the rule thumb method as the width of the thumb varies widely from one individual to another.

Simplification is the process of reducing the variety of items. It reduces the number of types and sizes of item s to a minimum; consistent with the needs of an organization. Simplification in company operators is an essential process of standardization.

Standardization is the process of formulating and applying rules for a beneficial and orderly approach to specific activity. It is based on consolidated efforts of science, technology and experience, reflecting in: (a) units of measurement

(b) Terminology

(c) Products

(d) Process

(e) Safety of persons.

The term "standard," or "technical standard" includes:

Common and repeated use of rules, conditions, guidelines or characteristics for products or related processes and production methods, and related management systems practices.

The definition of terms; classification of components; delineation of procedures; specification of dimensions, materials, performance, designs, or operations; measurement of quality and quantity in describing materials, processes, products, systems, services, or practices; test methods and sampling procedures; or descriptions of fit and measurements of size or strength.

2.2 Types of Standards

Standards may be classified in numerous ways. Standards can be differentiated **based on purpose**.

A basic standard has a broad ranging effect in a particular field, such as a standard for metal which affects a range of products from cars down to screws.

Terminology standards (or standardized nomenclature) define words permitting representatives of an industry or parties to a transaction to use a common, clearly understood language.

Test and measurement standards define the methods to be used to assess the performance or other characteristics of a product or process.

Product standards establish qualities or requirements for a product (or related group of products) to assure that it will serve its purpose effectively.

Process standards specify requirements to be met by a process, such as an assembly line operation, in order to function effectively.

Service standards, such as for repairing a car, establish requirements to be met in order to achieve the designated purpose effectively.

Interface standards, such as the point of connection between a telephone and a computer terminal, are concerned with the compatibility of products.

Standards on data to be provided contain lists of characteristics for which values or other data are to be stated for specifying the product, process or service.

International Standards have been developed through a process that is open to participation by representatives of all interested countries, transparent, consensus-based, and subject to due process. The existence of non-harmonized standards for similar products, processes, and services in different countries or regions can create barriers to trade. Therefore, export-minded countries and industries have recognized the need for internationally accepted standards to help rationalize the international trading process.

Standards may also be classified by the **intended user group**. Some examples include:

Company standards are meant for use by a single industrial organization and usually are developed internally.

International standards are developed and promulgated by international governmental and non-governmental organizations, such as the North Atlantic Treaty Organization (NATO) or the International Organization for Standardization (ISO).

Harmonized standards can be either an attempt by a country to make its standard compatible with an international, regional or other standard or it can be an agreement by two or more nations on the content and application of a standard, the latter of which tends to be mandatory.

Industry standards are developed and promulgated by an industry for materials and products related to that industry.

Government standards are developed and promulgated by Federal, State, and local agencies to address needs or applications peculiar to their missions and functions.

Another distinction among standards is **the manner in which they specify requirements**.

Performance standards describe how a product is supposed to function. A performance standard for water pipe might set requirements for the pressure per square inch that a pipe must withstand, along with a test method to determine if a specimen meets the requirement.

Design standards define characteristics or how the product is to be built. The specification that a pipe be made of a given gage of copper would characterize a design standard.

Government agencies are encouraged to write technical regulations and standards in terms of performance, rather than design characteristics.

Still another classification scheme distinguishes between *voluntary standards*, which by themselves impose no obligations regarding use, and *mandatory standards*. A mandatory standard is generally published as part of a code, rule or regulation by a regulatory government body and imposes an obligation on specified parties to conform to it. However, the distinction between these two categories may be lost when voluntary consensus standards are referenced in government regulations, effectively making them mandatory" standards.

It is clear, then, that standards cover a broad range of types and serve a wide variety of purposes.

Where appropriate purchasing should work with design, engineering, and operation to seek opportunities to standardize materials, components and supplies to increase the usage of standardize items. For example, a car manufacture could design different models of automobiles to use the same starter mechanism, thus increasing its usage and reducing the need for multiple items storage space. While allowing for large quantity price documents. This will also reduce the number of small value purchases for less frequently used items.

PROCEDURE OF STANDARDIZATION

The task force, responsible for standardization must follow procedure to get the items standardized. They should get all relevant facts from the concerned executive. They should develop standards which are easy to understand and to implement. There should be a constant reviewing, updating and monitoring committee so that best benefits accrue to the company. The process of standardization can be conceived on a three dimensional plane. To include factors such as levels, aspect, subject and there interrelation .the level includes individual, departments,

company, industry, nation, international, and universe. While the aspects may include forms, ethics, code of conducts procedures, contracts, inspection, testing sampling, agreements or reporting, notes etc. The third dimension, namely the subjects, encompasses industry, education, agriculture, communication, transport, mining, trade, commerce, energy, family planning, construction and administration.

The standardization process may take the form of a document containing a set of conditions to be fulfilled, a fundamental unit or physical constant or an object for physical comparison. The apex body of standards in Kenya is the Kenya bureau of standards (KeBS).

At international level, international standard organization is based in Geneva.

Items to be standardized

The warehouse and inventory manager should involve executives from design, maintenance, inspections, operations and costing department in order to ensure that the recommended standards are implemented. This team should update its knowledge on the latest available technological development to effectively implement the process of standardization. If the standard is approved as a company standard, the standard department should make necessary reproduction and distribute copies as mandatory to all concerned.

We have the kilogram as standard of weight, meters as the standard of length. Keeping to the right as the standard of the road, motors are made only in certain ratings, bulbs only in specific voltages, etc. Procedures, formats, reporting system, sampling inspections plans, letter heads, operating manual, standard costing method, etc. are the examples one comes across in the field of standardization. It is advantageous to tackle non critical high value, easily available item for standardization, as otherwise there will be opposition from design department. MRO-maintenance, repair and operation items like fasteners, hardware items, maintenance, etc. are a good starting point to impose standardization.

2.3 METHOD OF STANDARDIZATION

When ever published standards are available from outside sources the same can be applied. The frequency distribution of demand for each type and size of an item in terms of quantity of materials purchased/used /or products sold, would be an excellent starting point for standardization and

variety reduction in an organization. For instance, consider the example where the diameters in millimeters of pipes are 5.0, 5.1, 5.2, 5.3, 5.4 and the past pattern shows that only two sizes 5.1 and 5.4 are often used. Then the orders for the remaining three dimensions can be gradually discontinued if these items are not critical from performance and safety angles.

The preferred number series—a series of standard sizes in suitable steps used in the bulbs and currency—developed by Renaud and known as R-5, R-10, R-29, R-40 etc is another way of stating the standardization process.

2.4 Simplification

Simplification refers to reduction of the number of the company, supplier, or standard materials used in the product or process during product design. For example, an engine starter manufacturer could design all of its starter model to use a single type of housing or solenoid. Thus, simplification can further reduce the number of small value purchases while reducing storage space requirements, as well as allowing for quantity purchase discounts. Simplification can be achieved as follows;

i) Accumulating Small Order to Create a Large Order

Number small orders can be accumulated and mixed into a large order, especially if the material request is not urgent. Otherwise, purchasing can simply increase the order quantity if the ordering cost exceeds the inventory holding cost. Larger orders also reduce the purchase price and unit transportation cost.

ii) Using a fixed order interval for specific categories of materials/supplies

Another effective way to control small orders is to group materials and supplies into categories and then set fixed order intervals for each category. Order intervals can be set as biweekly or monthly depending on usage. Instead of requesting individual materials or supplies, users request the appropriate quantity of each item in the category on a single requisition to be purchased from a supplier. This increases the dollar value and decreases the number of small orders.

2.5 Benefit of standardization

The warehousing and inventory manager must have an unambiguous nomenclature for identifying the terms, in order to serve the customer promptly.

- a) In this process, standardization which reduces the variety plays a vital role by reducing the number of varieties of the same item held in the warehouse.
- b) More than any other executive, the stores in charge comes into direct contact with a variety of materials. He can gain knowledge on the uses of materials in the store and can contribute significantly to achieve standardization.
- c) Standardization enables one to concentrate on large quantity of fewer items.
- d) It is possible to place economic order quantity or orders of staggered deliveries with bulk discount.
- e) Economic lot size at manufacturing will not be a problem as items can as items can be manufactured with the same set up timings for standard items.
- f) Since the inventory is likely to be less, the working capital commitment of the organization will also be less.
- g) The items can be easily identified by all persons in stores as the bin location can also be standardized.
- h) Standardization reduce the time involve in negotiation process with the suppliers as communication is better with prompt delivery schedule.
- i) The procurement lead time gets reduce as everyone knows the item clearly.
- j) The buyer-seller relations can be improved as all dimensions including price analysis. Specifications lead time etc, are standardized without scope for disputes.
- k) Standardization promotes healthy competition amongst vendor as standard items can be bought by several companies.
- l) Standardization minimizes obsolescence.
- m) It is possible to have rate running contracts for standardized items.

- n) Standardization reduces design time by concentrating on fewer parts.
- o) It minimizes draft time through respective of standard drawings.
- p) It expands the engineers list of known and power items.
- q) It reduces specification writing by repetitive use of standard specifications.
- r) Interchangeability of parts is assured through standardization.
- s) Lower cost of production through continuous manufacturing run with less material handling problems and increased capacity utilization is achieved by standardization.
- t) The workers at all levels and departments become more efficient by repeated handling of items and it is possible to utilize less skilled workers for standard operations.
- u) Standardization enables reduced inspections and quality control burden.
- v) Since methods are standardized, it ensures safety to all.
- w) Standardization directly reduces the variety and improves the information system of the warehouse manager.
- x) Standardization enables reduced number of maintenance tools and improves maintenance practices.
- y) Standardization aims at maximum variety of finished product with minimum categories of assemblies, sub assemblies and components.
- z) In general, standardization result in simple operations, minimum paper work, improve inter departmental coordination, ease of computer application and pinpoints areas involving inefficiency. In short, standardization is a means to faster and better understood communication, with fewer mistakes and hence smoother life.

2.6 Roadblock to standardization

Standardizations should not lead to monotony and prohibit innovations. For instance, it is not possible to introduce standardizations of end products in job shops, but assemblies/parts constituting a final product may be standardized. Similarly, it is possible to standardize items like

shoes in terms of seven, or eight sizes. Standardizations must not lead to rigidity in design or restrict technical development. Standardizations is also based on previous practices.

In summary, the following points should be borne in mind;

- i) Identify the relevance of standardizations in warehousing and inventory management
- ii) Discuss the benefit of standardization to different departments in the organizations
- iii) Explain how you will identify the items of standardizations
- iv) Describe the procedures for standardizations
- v) Enumerate the pitfalls of standardization
- vi) Elucidate the applications of the concept of frequency distributions to standardizations
- vii) Clarify the concepts of preferred number series in relations to standardization
- viii) Specify the interrelationship between standardizations ,simplifications and specifications
- ix) Explain the role of Kenya bureau of standards in development of standards
- x) Examine the scope of standardizations in job shop, office and administrations.



Review Questions

- i) *Define the following terms:*
 - a) *standards*
 - b) *simplifications*
- ii) *discuss various types of standard classifications*
- iii) *discuss the importance of standardizations and simplifications*
- iv) *explain how simplifications are achieved*

Suggested Further Readings

- i) Arjan Van Weele (2004), *Purchasing and Supply Chain Management*, PVT publishers, New Delhi
- ii) Benton W C (2007), *Purchasing and Supply Management*, Routledge, London
- iii) Gopalakrishnan P(1994)*Handbook of Material Management*,Prentice Hall,India

CHAPTER THREE

OUTSOURCING AND MAKE OR BUY DECISIONS



Learning Objectives

By the end of this chapter the learner should be able to:

- i) Explain the basic issues in make or buy decisions*
- ii) Discuss why firms outsource*
- iii) Differentiate between turnkey and partial outsourcing*
- iv) Explain the motives of outsourcing under:
Focus on core competence.
Focus on cost efficiency/effectiveness and
Focus on service*
- v) Explain factors found by McQuiston to be core to a successful outsourcing relationship*
- vi) Describe the outsourcing process*
- vii) Describe the four phase strategic outsourcing model*
- viii) Describe the factors considered in deciding where to buy*

3.1 Introduction

Many chief executives consider the make-or-buy decision to be among the most critical and most difficult confronting their organizations. Not only are billions of dollars needlessly wasted if the wrong decision is made, but scarce management resources frequently are stretched past the breaking point.

Outsourcing is a term being used in relation to services such as accounting, maintenance, security, promotion, stocking, and the like. The basic issues are the same concerning the question of doing it yourself or contracting with an independent outside the buying firm.

The strategic issue requires the firm to identify its core competencies-the things that differentiate it and make it viable. If an item or service at or near the heart of the firm's core

competencies is to be outsourced, it should only be supplied by a carefully selected supplier under a tightly woven strategic alliance.

Top management has the ultimate responsibility for make-or-buy decisions. In most cases, this responsibility can be satisfied through operating procedures that develop and pool all relevant information surrounding a make-or-buy issue. Purchasing is a source of much of this information. Also, Purchasing frequently should identify candidates for a make-or-buy analysis.

Five major problems are common in the make-or-buy area namely:

1. Make-or-buy decisions are made at too low a level in the organization.
2. Not all factors are considered when conducting a make-or-buy analysis.
3. Decisions are not reviewed on a periodic basis. Circumstances change!
4. The *estimates* underlying the cost of making are less objective and accurate than the *purchase facts*.
5. Members of the buying company assume they know more than the supplier about the material or service.

3.2 Make or buy issues

a) The Strategic issues

"What kind of an organization do we want to be?" This issue is the first, and perhaps most critical, to be addressed. Pride or purely emotional reasoning plays a major part in many decisions. Pride in Self-sufficiency can become a dominant factor that can lead to many problems. While self-sufficiency in some areas is desirable or even necessary, it is impossible for even a large firm to become entirely self-sufficient.

These decisions influence the firms manufacturing operation shape and capacity by determining;

- What product to make
- What investments to make in plant and equipment
- The framework for short term tactical and component decisions.
- Development of new products.

II) Tactical make or buy decisions

This deal with the issue of temporary imbalance in manufacturing capacity e.g. changes in demand may make it possible to make everything in house.

III) Component make or buy decisions

Made at the design stage, these decisions have to do with whether a particular component should be made in – house or is bought.

b) **Costs**

Two keys prerequisites are essential to a thorough and sound analysis of the cost considerations of a make-or-buy decision.

Cost must be segregated between fixed costs and variable or incremental ones. Such cost figures must include all relevant costs, both direct and indirect, near term and anticipated changes. Realistic estimates of in-house production costs must include expected rejection rates and spoilage. These estimates also should consider the likely effects of learning resulting from long production runs.

Accurate and realistic data must be available on the investment required to make or to buy an item. Frequently, the working capital required in the manufacture of an item can equal and even exceed the investment required for facilities and equipment. It is essential to consider both the facilities and the working capital components of an investment.

Cost factor in make or buy decisions often require the application of marginal costing and break – even analysis

i) marginal costing

this is a principle whereby valuable costs are charged to cost units and the fixed costs attributable to the relevant period written off in full against the contributions for that period
 $\text{contribution} = \text{purchase price} - \text{vc per them}$

Example;

D.T. Dobic requires 10,000 shock absorbers for the assembly of Nissan pick ups in Kenya. The company could make this shock absorbers ltd which sells its shocks at ksh 1560. Only 30% of

the fixed costs are recoverable if the component is bought. The following are the costs that D.T. Doble would incur should it decide to make the shocks.

	Ksh
Materials	900
Labour	400
V. overhead	100
Fixed overheads	200

Should D.T Dobie buy or make the shocks?

	Make	Buy	Difference
Valuable costs (900x400x100)	1400	1560	160
Volume (10000)	14,000,000	15,600,000	1,600,000
Fixed (30 % of 200 x 10,000)	<u>600,000</u>	600,000	-
	14,600,000	16,200,000	1,600,000

v.c = variable cost

In consequences buying instead of making profits would reduce by ksh 1,000,000. (15c – 146). It is therefore advisable to make the shocks. This decision is made in light of the fact that fixed costs of ksh 600,000 would likely continue since the capacity would be unused the fixed overheads would not be absorbed into production.

Question;

If the buying price was reduced from 1560 to 1450 should the firm make the shocks or buy them

	Make	Buy	Difference
Valuable costs	Ksh 1400	1450	50

Volume 10,000	14,000,000	14,500,000	500,000
Fixed costs	<u>600,000</u>	<u>600,000</u>	-
	14,600,000	15,100,000	500,000

D .J Dobic should buy the shocks since by Buying the firm will reduce the Costs attributable to the shocks by 100,000 thereby earning the firm a profit of the same amount (a shilling saved is a shilling earned) i.e. if the firm was to make the final costs of the shock will be 14,600,000/= which it could buy them @ 14,500,000/=.

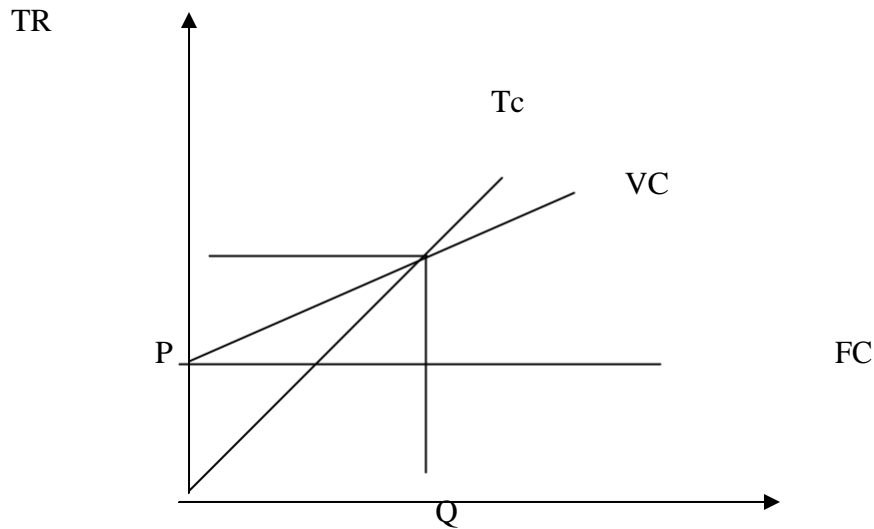
ii) Break – even analysis

This is the determination of the level of activity in units to value at which total revenues equal total costs.

B .E .P is given by $\frac{f}{P - V} = BEP$

$$P - V$$

Where; F = fixed costs, p= purchase price, v = valuable cost per unit.



$$B.E.P \text{ (units)} = \frac{\text{total fixed costs}}{\text{Selling price} - \text{variable costs per unit}}$$

B.E.P (sh) = fixed costs

Contribution ratio (CR)

Fixed costs

P/v

CR = sales – variable costs

Sales

= 1 – valuable costs

Sales

CR = P/V

Profit volume ratio

Using the D.T Dobic example;

600, 000 = 600,000 = 3750 shocks

1560 – 1400 160

This means that;

- if only 3750 shock are required then one are will be indifferent on whether to make or buy
- if more than 3750 shocks are required as is the case then it is wise to make
- If less than 3750 shocks are required then buying is a better alternative.
- Why is this so?

ii) opportunity cost

This is the potential benefit that is foregone because one course of action has been chosen over another. I.e. if the production facilities used in making the item had been applied to some alternative purpose.

Using the D.T Dobic example, if instead of producing the shocks the facilities could be used to make suspension springs with a contribution of ksh 175 each.

Should D.T Dobic make the shocks or buy.

Making	Buying but production	Buying less
	Capacity not used	Opportunity cost
Ksh 14,000,000	15,600,000/=	15,600,000
		- <u>1,750,000</u>
		<u>13,850,000</u>

D.T Dobic should in this case buy the shocks why?

3750 Units	3000 units	4000 units
Make 5250000	4,200,000	5600000
Buy <u>5,850,000</u>	<u>4,680,000</u>	<u>6,240,000</u>
600,000	480,000	640,000
- <u>600,000</u>	<u>600,000</u>	<u>600,000</u>
<u>0</u>	- <u>120,000</u>	+ <u>40,000</u>

❖ example II – break when analysis

What would be the decision points if the price of the shocks were reduced from 1560 to 1450/=

Using Break even analysis

$$\frac{f}{p - V} = \frac{600,000}{1450 - 1400} = \frac{600,000}{50}$$

They would need to produce 12,000 units to break even since the firm needs 10,000 shocks then they would rather buy.

❖ Example II – opportunity cost

Valuable D.T Dobic makes or buy the shocks

(i) The contribution of the suspension springs reduce of from 175/= to 160/= - 156
00000 – 160 000000

- same cost structure this indifference

(ii)The price of the shocks reduced from 1560/= to 1450/= with the contribution of the suspension springs at

(a) 175/=	(a) 14500,000	(b) 14500,000
(b) 160/=	- <u>1750000</u>	<u>1600000</u>
	<u>12,750,000</u>	<u>12,900,000</u>

(a) They should buy the shocks

(b) They should buy the shocks.

If D.T Dobic buys the shocks and uses the facilities to make suspension springs the cost structure for both activities will be 13,850,000/= against a cost structure of 14,000,000 were the firm to make the shocks instead. Thus in buying the shocks DT Dobic will have made/ earned ksh 150,000 (14,000,000 – 13,850,000)

(iv) Learning curves / skill acquisition / experience curve

This a graphical representation of the rate at which skills or knowledge is acquired is a period of time. The basis of learning curves is that “skill to do come by doing. I.e. A task is performed more quickly with each subsequence replication until a point is reached where no further improvement is possible and performance levels out.

The learning curve theorem states that each time the number of production units is doubled, the cumulative average lab our hrs per unit’s previous cumulative average.

The learning curve equation is $y = a x^b$

Where y = cumulative average time per unit

X = number of units produced so far

A = time taken to produce the first item

B = log (learning rate)

Log (2)

E.g. if the learning rate to produce shock absorbers is 80% and it requests 1 day to produce one shock absorber, then to produce 2 shocks is 1.6 days with a cumulative average of

$$B = \frac{\log (0.8)}{\log (2)} = \frac{-0.09691}{0.301} = (-) \frac{0.09691}{0.301}$$

$$\frac{\log (2)}{\log (2)} = \frac{0.301}{0.301}$$

$$b = -0.322$$

$$y = ax^b$$

$$= a \times -0.322$$

$$= a \times 0.322$$

For 2 shocks

$$\frac{1}{2} \times 0.322 = 0.8 \text{ days per item/shock}$$

$$= 1.6 \text{ days for 2 shocks}$$

For 5 shocks

$$Y = \frac{1}{5} \times 0.322 = 0.5956 \text{ days per shock}$$

$$= 2.98 \text{ days for 5 shocks}$$

For 7 shocks

$$Y = \frac{1}{7} \times 0.322 = 0.534 \text{ days per shock}$$

$$= 3.74 \text{ days for 7 shocks}$$

For 10 shocks

$$Y = 1/10 \ 0.322 = 0.476 \text{ days per shock}$$

$$= 4.76 \text{ days for 10 shocks}$$

For 12 shocks

$$Y = 1/12 \ 0.322 = 0.499 \text{ days per shock}$$

$$= 5.39 \text{ days for 12 shocks}$$

0.8 days and for 8 shock is 4.10 days with a cumulative average of 0.51 days per shock etc

The graph is then plotted using cumulative average time against units produced.

When components are bought from specialist manufacturers there may be little opportunity for learning. When items are new the costs of making and buying may have to be adjusted for the learning factors.

Other considerations in make or buy decisions

Infavour of making

I) Cost considerations

The major elements of the cost considerations are:

- Materials and labour costs
- Follow on costs stemming from quality related problem
- Incremental inventory carry on costs
- Incremental factory overhead costs
- Incremental management costs
- Incremental purchase costs
- Incremental costs of capital

ii) Desire to integrate plant operations

iii) Reproductive use of excess plant capacity to help absorb fixed costs

iv) Need to exert direct control over production and /or quality.

- v) Design secrecy required
- vi) Unreliable suppliers
- i) Desire to maintain a stable work force (in periods of low sales)
- ii) Potential lead time reduction
- iii) Exchange rate risk
- iv) Greater purchasing power with bulk purchase of materials.

C) Quality

When there is a significant difference in quality between items produced internally and items purchased or when a specified quality cannot be purchased, then management must consider these quality considerations in the make-or-buy decision. One argument for making over buying is the so-called impossibility of finding a supplier capable or willing to manufacture the item to the desired specifications. But further investigation should be conducted before this argument can be accepted.

Why are these specifications so much more rigid than those of the rest of the industry?

The Manufacturer should reexamine the specifications and make every effort to secure the cooperation of potential suppliers to ensure that the quality specifications are realistic and that no satisfactory product is available. Frequently, suppliers can suggest alternatives that are just as dependable if they know the intended purpose of the item.

On the other hand, the firm may desire a level of quality below that commercially available. Suppliers may be selling only a quality far above that which would fully satisfy the need in question and may, at the same time, have so satisfactory a volume at the higher level as to have no interest in a lower quality product. If this is the case, the user may be justified in manufacturing the item.

Frequently, it is claimed that in-house production may better satisfy manufacturing's quality requirements. The user of an item usually better understands the operational intricacies involved in the item's use. With a make decision, a better degree of coordination will probably exist between those responsible for producing the item and those responsible for assembling it. Communications between the two groups are facilitated compared with the situation in which the item is furnished by an outside supplier. If the firm has a weak purchasing department, such assumptions may be true. But with a professional purchasing operation, the flow of information and coordination

between purchaser and supplier should result in no more problems than between two production activities of the same firm.

Since quality must be controlled in either the purchased or manufactured items, a competent quality assurance staff and a TQM (total quality management) program must be employed. The purchase order may state that the purchaser's quality assurance inspectors have access to the supplier's manufacturing, inspection, and shipping departments. Thus, the purchaser can maintain significant control and still not incur the additional cost resulting from manufacturing the item.

c) Quantity

One of the most frequent reasons for making over buying is that a requirement may be too small to interest suppliers. Small volume requirements of unique, nonstandard items may be difficult to purchase. The firm may feel that it is forced to make such items; however, it may be economically imprudent to do so. The costs of planning, tooling, setup, and purchase of required raw materials may be exorbitant. It may be far more cost effective to purchase the required item in larger quantities or to identify a suitable substitute.

If a large quantity of an item is required on a repetitive basis, then the analysis described in the Cost section should be made. The company should have a high degree of confidence that its requirements for the item will continue to the point that it receives a satisfactory ROI before deciding to make such an item.

Frequently a firm will follow a conscious policy of making an item at a level of production sufficient to meet its minimum requirements and purchase additional items as required. This policy builds a degree of stability into the firm's production activities and provides accurate comparative cost data. Such a policy should be adopted only after investigating the willingness and ability of suppliers to fill such fluctuating demand.

d) Service

Service often is defined simply as reliable delivery. In a broader sense, it includes a wide variety of intangible factors that lead to greater satisfaction on the part of the purchasing firm. This consideration must be judged fairly and the purchasing firm must not be given undue credit with respect to service simply for emotional reasons. Merely because the item is produced in-house is not proof that service will be superior to that of a supplier.

Assurance of supply is a primary service consideration. When the lack of an item causes serious

problems, such as total production stoppage, and totally reliable suppliers are not available, the decision to make rather than buy may be justified.

When a purchaser is faced with a monopolistic environment, the service accompanying the product is generally somewhat poorer than in a highly competitive market. Such a situation may induce the would-be purchaser to make the product. If an item is used as a subcomponent on a product the purchaser is selling and is causing the entire product to be unreliable, the resulting loss of goodwill and sales may be significant enough to justify a make decision, even though the cost analysis does not support such a decision.

e) Specialized Knowledge

Frequently, a supplier possesses specialized knowledge, abilities, and production know-how that would be very expensive to duplicate. Suppliers may have a large R&D budget leading to improved and/or less expensive products.

The protection of innovation achieved by the supplier is a critical aspect of trust, that is, the buyer *must not under any condition* give this innovation to a supplier's competitor or use the technology were it to make the item.

f) Design or Production Process Secrecy

Occasionally, a firm decides to manufacture a certain part because additional industrial security can be provided, especially when the item is a key part for which a patent would not provide adequate protection. This justification must be used with caution, however, as the firm can provide very little protection against design infringement after sale. In short, if a patent will not protect a certain part, then in-house manufacturing may not either. Frequently, a firm may have developed a unique or proprietary production process. Such circumstances may support a decision to make over buying.

g) Urgent Requirements

The firm usually can purchase a small quantity much more readily than were it to produce the item. If the requirement is urgent, such as to preclude stopping an assembly line, the payment of a higher price to buy the item is justified.

h) Labor Problems

The production of any new item may require labor skills that the company does not possess. The hiring, cross-training, and upgrading of personnel may be a troublesome and complex process, especially if a union is involved. The company may be entering a field in which it has no experience and no adequately trained personnel. Labor problems are easily shifted to someone else, namely, the supplier, through a decision to buy.

The presence of unions within the company also may be a significant factor. Unions often have clauses in their contract prohibiting the purchasing of items that can be manufactured within the plant. The history of labor problems in the supplier's company also may influence the make-or-buy decision.

i) Plant Capacity

Obviously the more significant the item in question is relative to the company's size, the greater the probability that the item will be purchased rather than produced in house. When the item would require a significant investment, the smaller company has no rational decision other than to buy.

Generally the more mature company will try to integrate items currently purchased into its production more often than will a new company. The new company understandably concentrates on increasing output and has very little excess capital or plant capacity to divert to production of components. Quite the opposite is true for the more mature company. Such a firm tends to have extra facilities, capital, and personnel and, therefore, is in a better position to increase profit by producing what was formerly purchased. Excess plant capacity and the likely duration of the excess capacity should always be considered in the make-or buy decision as should additional expenses such as tooling, setup, and training.

j) Capital Equipment

Manufacturers sometimes find it necessary to make a needed item, simply because a suitable supplier does not exist. This is most frequently the case with highly specialized manufacturing equipment.

k) Use of Idle Resources

A make decision can prove profitable to a firm even when suitable supplies are available. In periods of recession or business slumps, a firm is faced with the problem of idle plant equipment, labor, and management. By making a product that it may have been buying, a firm can put its idle machinery to work, retain skilled employees, and spread its overhead costs over a larger volume of production.

Perhaps the biggest benefits obtained from a make decision during a slump are in the area of labor relations. Employee morale can be maintained and layoff penalty costs can be avoided by timely use of the make decision. Even in times of recession, most firms find it desirable to retain highly skilled production personnel. These personnel can be kept at work and a stable workforce maintained by a decision to make. The long-run benefits from good labor relations are obvious.

Great caution must be taken when basing a make decision primarily on temporary idle resources. Make decisions tend to be permanent. A decision to make temporarily an item under such circumstances should be reviewed when demand increases.

3.3 Make and Buy

Some firms make and buy critical nonstandard items to ensure that a reliable second source is available in case of difficulty with the supplier. Such a policy also provides data that are useful in reviewing internal production and management efficiency.

Making the Decision

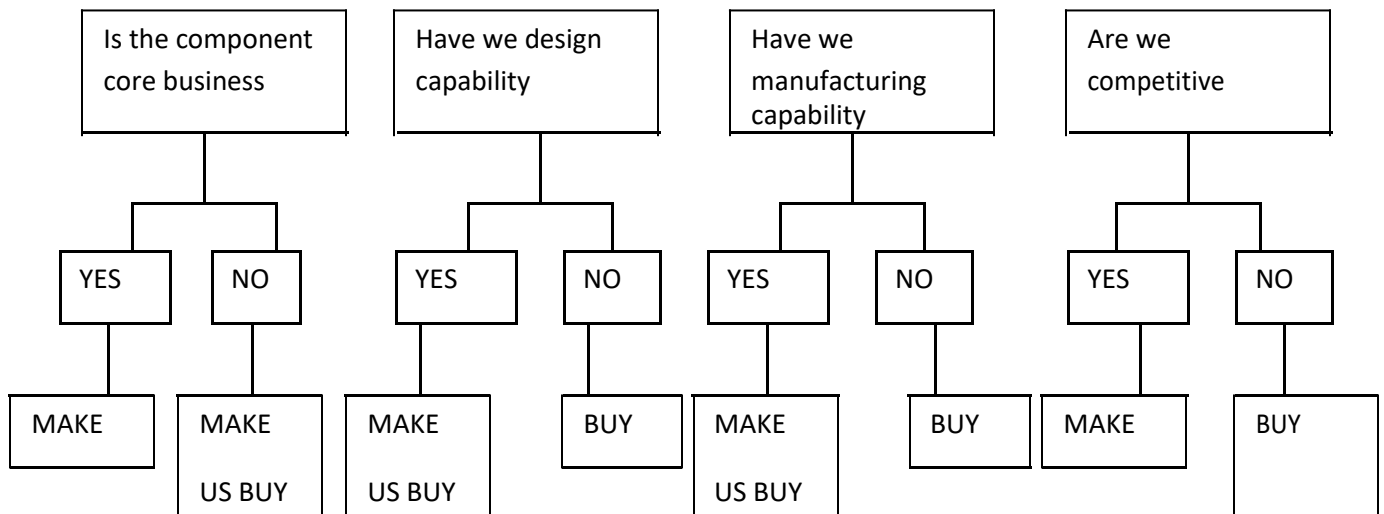
Make-or-buy decisions can have a critical effect on the economic health of a firm, even on its survival.

Frequently, these decisions are made at too low a level in the organization. On many occasions, no conscious decision appears to have been made. Things just happen! The decision to make is often weaker than the decision to buy because buy costs are known whereas make costs are estimates. Obviously, the amount of time and effort and the level of managerial attention appropriate are functions of the amount of money involved and the criticality of the item to the firm's well-being. Normally several departments should be interested and involved in make-or-buy decisions: Production, Purchasing, Engineering, Finance, and Marketing.

Any of the following situations should precipitate a make-or-buy analysis:

- * *New product development and modification.* Every major component should be reviewed.
- * *Unsatisfactory supplier performance.* If purchasing is unable to develop reliable sources for an item, the item should be reviewed and analyzed to ensure that the specified quantity level is essential and to ensure that suitable substitutes are not available. If the item, as specified, passes these reviews, it becomes a candidate for in-house sourcing.
- * *Changes in sales.* Sales demand that exceeds capacity calls for a make-or-buy review of those items produced in house that contribute the lowest ROI. Declines in sales and production should prompt a review of candidates for in-house production.
- * *Periodic review of previous decisions.* Changing costs and other considerations can convert a good make-or-buy decision into a bad one very quickly. Major make-or-buy decisions should be reviewed as a component of the firm's annual planning process.

Decision process for make or buy



3.4 OUTSOURCING

This is the strategic use of resources to perform activities traditionally handled by international staff and their resources. An alternative definition is the buying in of components, sub – assemblers finished products and service from outside suppliers rather than supplying them internally. It is strategy by which an org outstand.

The term “outsourcing” probably refers to buying materials or components from suppliers instead of making them in-house. It also refers to buying materials or components that were previously made in-house. In recent years, the trend has been moving toward outsourcing combined with the creation of supply chain relationships, although traditionally firms preferred the make option by using backward and forward vertical integration. **Backward vertical integration** refers to acquiring upstream suppliers, whereas **forward vertical integration** refers to acquiring downstream customers. For example, an end-product manufacturer acquiring a supplier’s operations that supplied component parts is an example of backward integration. Acquiring a distributor or other outbound logistic providers would be an example of forward integration.

Whether to **make or buy** materials or components is a strategic decision that can impact an organization’s competitive position. It is obvious that most organizations buy their MRO and office supplies rather than make the items themselves. Similarly, seafood restaurants usually buy their fresh seafood from fish market. However, the decision on whether to make or buy technically advanced engineering parts that impact the firm’s competitive position is a complicated one.

Traditionally, cost has been the major driver when making sourcing decisions. However, organizations today focus more on the strategic impact of the sourcing decision on the firm’s competitive advantage.

Generally, organizations outsourcing noncore activities while focusing on core competencies. Finally, the make-or-buy decision is not an exclusive either-or option. Firms can always choose to make some components or services in-house and buy the rest from suppliers.

3.5 Reasons for buying or Outsourcing

Organizations buy or outsource materials, components, and/or services from suppliers for many reasons.

1. **Cost advantage:** For many firms, cost is an important reason for buying or outsourcing, especially for supplies and components that are nonvital to the organization’s operations and

competitive advantage. This is usually true for standardized or generic supplies and materials for which suppliers may have the advantage of **economies of scale** because they supply the same items to multiple users. In most outsourcing cases, the quantity needed is so small that it does not justify the investment in capital equipment to make the item. Some foreign suppliers may also offer cost advantage because of lower labour and/or materials costs.

2. ***Insufficient capacity:*** A firm may be running at or near capacity, making it unable to produce the components in-house. This can happen when demand grows faster than anticipated or when expansion strategies fail to meet demand. The firm buys parts or components to free up capacity in the short term to focus on vital operations. Firms may even subcontract vital components and/or operations under very strict terms and conditions in order to meet demand. When managed properly, subcontracting, instead of buying, is a more effective means to expand short-term capacity because the buying firm can exert better control over the manufacturing process and other requirements of the component parts or end products.
3. ***Lack of expertise:*** The firm may not have the necessary technology and expertise to manufacture the item. Maintaining long term technological and economical viability for noncore activities may be affecting the firm's ability to focus on core competencies. Suppliers may hold the patent to the process or product in question, thus precluding the make option, or the firm may not be able to meet environmental and safety standards to manufacture the item.
4. ***Quality:*** Purchased components may be superior in quality because suppliers have better technology, process, skilled labor and the advantage of economies of scale. Suppliers may be investing more in research and development. Suppliers' superior quality may help firms stay on top of product and process technology, especially in high-technology industries with rapid innovation and short product life cycles.

An organization also makes its own materials, components, service and/or equipment in-house for many reasons. Let us briefly review these reasons;

1. ***Protect proprietary technology:*** A major reason for the make option is to protect proprietary technology. A firm may have developed an equipment, product, or process that needs to be protected for the sake of competitive advantage. Firms may choose not to reveal the technology by asking suppliers to make it, even if it is patent. An advantage of not revealing the technology is to be able to surprise competitors and bring new products to market ahead of competition, allowing the firm to charge a price premium.

2. ***No competent supplier:*** If the component does not exist, or suppliers do not have the technology or capability to produce it, the firm may have no choice but to make an item in-house, at least for the short term. The firm may use suppliers development strategies to work with a new or existing supplier to produce the component in the future as a long-term strategy.
3. ***Better quality control:*** If the firm is capable, the make option allows for the most direct control over the design, manufacturing process, labour and other inputs to ensure that high quality components are built. The firm may be so experienced and efficient in manufacturing the component that suppliers are unable to meet its exact specifications and requirements. On the other hand, suppliers may have better technology and processes to produce better quality components. Thus, the sourcing option ensuring a higher quality level is a debatable question and must be investigated thoroughly.
4. ***Use existing idle capacity:*** A short term solution for a firm with excess idle capacity is to use the excess capacity to make some of its components. This strategy is valuable for firms that produces seasonal products. It avoids laying off skilled workers and, when business picks up, the capacity is readily available to meet the demand.
5. ***Control of lead-time, transpiration, and warehousing cost:*** The make option provides easier control of lead time and logistical costs since management controls all phases of the design, manufacturing and delivery process. Although raw materials may have to be transported, finished goods can be produced near the point of use, for instance, to minimize holding cost.

Outsourcing can be described as the transfer of activities, that were previously conducted in-house, to a third party. Ellram and Billington (2001) see outsourcing primarily as the transfer of the production of goods or service that had been performed internally to an external party.

Outsourcing means that the company divests itself of the resources to fill a particular activity to another company to focus more effectively on its own competence.

The difference with subcontracting is the divestment of assets, infrastructure, people and competencies.

3.6 Types of outsourcing

There are two different types of outsourcing namely :

turnkey integral and

Partial outsourcing.

Turnkey outsourcing applies when the responsibility for the execution of the entire function (or activities) lies with the external supplier. This includes not only the execution of the activities but also the coordination of these activities. Partial outsourcing refers to the case in which only a part of an integrated function is outsourced.

The advantages and disadvantages of Turnkey and partial outsourcing

	Advantages	Disadvantages
Turnkey outsourcing	Buyer has minimal responsibility for outsource processes.	The buyer has limited influence on the determination of the price and little insight into cost structure of provider.
	Buyer doesn't need to have experience with similar projects.	The buyer has limited influence on the staff, technology and materials used and their quality.
	The project generally goes smoothly for the buyer.	Large dependence of buyer on provider resulting in high commercial, technical and performance risks.
Partial outsourcing	The buyer has more influence on prices, rates and costs.	The buyer is required to have knowledge of the separate parts of the outsourced functions/activities.
	The buyer has more influence on the staff, technology and materials used and their quality.	The buyer is required to have the organizational capacities to coordinate and integrate the outsourced functions/activities.
	Specific advantages can result in cost reductions.	Communication and coordination problems between parties involved can be a cause of delay and disappointment.
	Optimal usage of knowledge, equipment and experience of third	Continuous follow-up and monitoring of the supplier

	party	relationship is necessary
	Increased flexibility: fluctuations in the workload can more easily be absorbed.	Risks of communication and organizational problems during the transfer of activities to a third party.
	Outsourcing leads to easier and more focused primary processes in the organization.	Risk of leakage of confidential information
	Input through an independent party's point of view which reduces the risks of introvert short-sightedness in the organization	Depending on balance of power between parties; inability to execute contractual performance incentives and penalties.
		Risk of losing essential strategic knowledge.

3.7 Strategic phase

During the strategic phase three essential questions have to be answered:

The question relates to the objective of the firm with regard to its intent to outsource a certain activity.

what activities are considered for outsourcing.

what qualifications a supplier should be able to meet in order to qualify as a potential future partner for providing the activity concerned must be answered. The decision to outsource should support and enable the company's overall strategy. The motives that are cited most are:

1. Focus on core competence.
2. Focus on cost efficiency/effectiveness and
3. Focus on service

This motives and that strategy of the outsourcing company should be aligned. These three motives and the outsourced activities should contribute to this strategy.

The second question relates to what should be outsourced. Two important approaches are used to answer this question;

The transaction cost approach and

The core competence approach.

The transaction cost approach is based on the idea of finding a governance structure aimed at arriving at the lowest cost possible for each transaction that is made.

Transaction cost is defined as the costs that are associated with an exchange between two parties.

The assumptions of the transaction costs approach is that an exchange with an external party is based upon a contract. The (potential) costs associated with establishing, Monitoring and enforcing the contract, as well as the costs associated with managing the relationship with the external party, are all considered to be part of the transaction costs as well as the costs associated with the transaction itself. Therefore all of these costs should be taken into account when deciding between make or buy options.

The level of the transaction costs depends upon three important factors. These factors are:

- frequency of the transaction,

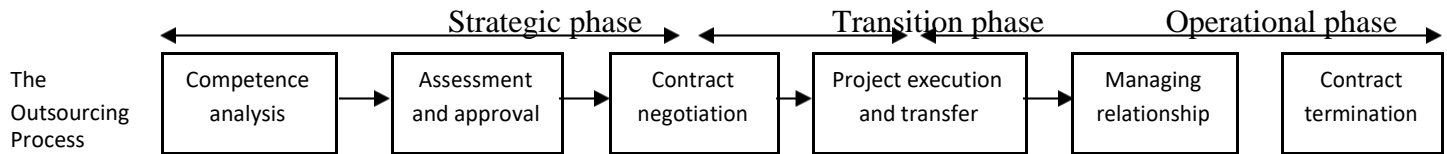
- the level of the transaction specific investments

- and the external and internal uncertainty.

The frequency of the transaction is an important factor because the more frequently exchanges occur between partners, the higher the total costs that are involved. The level of the transaction-specific investments also determines the level of transaction costs, because transaction-specific investments are investments that are more or less unique to a specific buyer-supplier relationship.

Examples are investments in specific supplier tooling (such as molds and dies) by a large automotive manufacturer and the change costs involved when choosing a new accountant (internal staff need to get accustomed to the new accountant, the new accountant needs to be thoroughly briefed to get acquainted with the company etc.). These examples show that investments are made in assets as well as in human capital. Obviously the higher these investments are, the higher the transaction cost will be. The last factor that determines the transaction costs is the external and internal uncertainty. Uncertainty is a normal parameter in the decision-making process. It can be defined as the inability to predict contingencies that may occur. The higher these uncertainties, the more slack a supplier wants to have in presenting his proposal and rates, and the more difficult it will be to make a fixed price or lump sum contract that deals with all uncertainties beforehand.

The outsourcing process



Therefore, the higher the level of uncertainty, the higher the transaction costs will be.

The other approach on which an outsourcing decision can be based is the core competence approach. This theory is based, among others, on the work of Quinn and Hilmer (1994). The core competence approach is based on the assumption that, in order to create a sustainable competitive advantage, a company should concentrate its resources on a set of core competencies where it can achieve definable pre-eminence and provide a unique value for customers ... (hence it should) strategically outsource all other activities' (Quinn and Hilmer, 1994 p43). The important question to be answered here is what are the firm's core competence. Characteristics of core competence are;

- Skills or knowledge sets, not products or functions
- Flexible, long term platforms that are capable of adaptation
- Limited in number; generally two or three
- Unique sources of leverage in the value chain
- Areas where the company can dominate
- Elements important to the customer in the long run
- Embedded in the organization's system

The competencies that satisfy these requirements are the core competencies and provide the firm with its long-term competitive advantage. These competencies must be closely protected and are not to be outsourced. All other activities should be procured from the markets if these markets are totally reliable and efficient.

Long and Vickers-Koch (1992) distinguish five categories of a firm's activities, instead of two categories, core or non-core, (Quinn and Hilmer 1994). These five categories are;

- Cutting edge activities. The activities that determine the competitiveness of the organization from a long term perspective.
- Core activities. The activities that create the foundation and main process for the organization and its possible competitive advantages.
- Support activities. Those activities that are directly connected to the core competences.

- Separate activities. The activities that are part of the main process, but easily separated from that process and not related to the core competences.
- Peripheral activities. The activities that do not concern the main process.

Anold (2000) also makes a further distinction in a firm's activities. He distinguishes between:

- Company core activities. Activities that are directly to the core activities.
- Close-core activities. The activities that are directly related to the core activities.
- Core distinct activities. The supporting activities.
- Disposable activities. Activities with general availability.

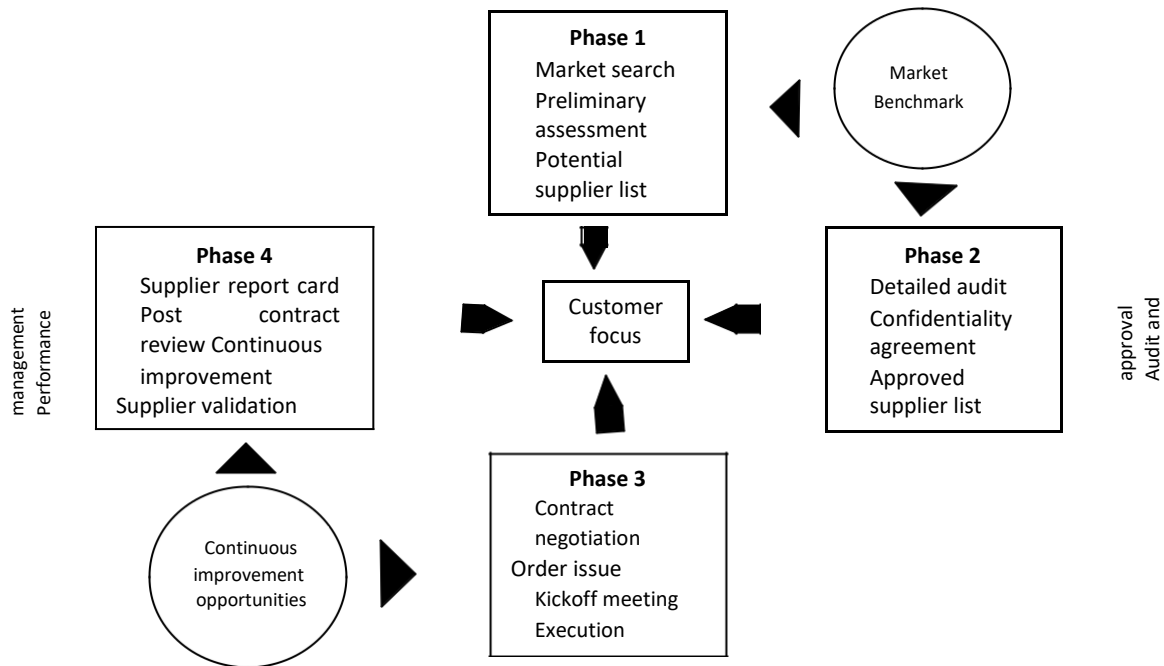
Both studies imply that the outsourcing decision framework based upon the work of Quinn and Hilmer (1994) needs adjustment. Anold (2000) has developed a general model for whom the function should be outsourced. After the decision to outsource has it is essential that the right supplier is chosen. A supplier has to be selected who has the necessary technical and managerial capabilities to deliver the expected and required level of performance. Also the supplier should be able to understand and be committed to these requirements.

The supplier selection process is key to the success of the buyer-supplier relationship. Companies that make extensive use of supplier selection and monitoring practices in supplier partnership seem to be more successful than the companies. An adequate supplier selection model is crucial for the success of the outsourcing decision.

Momme and Hvolby (2002) present a four-phase model (figure below). This model gives guidance on how to identify, evaluate and select outsourcing candidates and therefore is an appropriate tool to use in the strategic phase. It also gives a brief guidance for the transition (phase 2 and 3) and the operational phase (phase 4), but needs to be elaborated for that purpose.

Four phase strategic outsourcing model

Identification and
assessment



Project
execution

After the strategic phase in which the outsourced activities and supplier have been identified, the transmission phase starts. The transition consists of the contract negotiation and the project execution and transfer. The most important issue in the contract negotiation in an outsourcing agreement is often the start of a long term relationship, so not only the contractual issues should be dealt with but the people issues and the importance of a sound and cooperative relationship should be covered as well.

The contract is the legal basis for the relationship and is therefore the key document in the outsourcing process. It allows both organizations to maximize the rewards of the relationship, while minimizing the risk. This makes the outsourcing contract key success factor for the establishment of a strategic outsourcing relationship.

The contract and the type of contract should reflect the business plan (the goal of the cooperation) the two parties have and should be reasonable for both parties.

There are different types of contracts. The type chosen depends on the characteristics and the scope of the contract and the functions or activities that are outsourced.

After the transition phase has successfully ended, the operational phase of the outsourcing process starts. This operational phase consists of two processes namely:

Managing the relationship
and Contract termination.

Managing the buyer-supplier relationship management is one of the, if not the critical stage in the outsourcing relationship. Achieving the goals of the outsourcing relationship is impossible without close cooperation. When the relationship is not properly managed the conditions for close cooperation will not be present and the outcome of the outsourcing relationship will be far from optimal.

The true value of outsourcing comes after the relationship has had time to develop and additional synergies have emerged. Creating a sustaining, long relationship with a supplier is exciting: it's where the win-win is really beginning to show.

Many researchers have written on the characteristics of a successful buyer-supplier relationship.

The top five include

the factors trust,
flexibility,
team approach,
shared objectives and
open communication.

The factors found by McQuiston to be core to a successful outsourcing relationship are presented in the table below.

Core values	Supporting factors
Shared goals and objectives Mutual dependence Open line for communication Concerned for the other's profitability Mutual commitment to customer satisfaction Trust	Developing a personal relationship Having professional respect Investment of effort by top management Commitment to continuous improvement

Suggested Further Readings

- i) Sudhi Seshadri (2005) *Sourcing Strategy: Principles, Policy and Designs*, PVT publishers, New Delhi
- ii) Elizabeth Anne Sparrow (2007), *Guide To Global Sourcing*, Prentice Hall, Chicago
- iii) Larry Paquette (2004), *Sourcing Solution*, Routledge, London

CHAPTER FOUR

THE PURCHASING AND NEW PRODUCT DEVELOPMENT



Learning Objectives

By the end of this chapter the learner should be able to:

- a) Describe the process of new product development*
- b) State the role of purchasing in new product development*
- c) Explain the conflicts that are likely to arise between engineering and other functions within the organization*
- d) Discuss the design of new product stage and the degree of its complexities*

4.1 Introduction

Many companies attempt to track down new technologies and product through systematic market research. The results of this research are usually translated by the marketing department into several new products idea which are then discussed with research and development and the engineering department. These discussions are often the starting point for projects aimed at improving current products or the developments of new ones.

4.2 The process of new product development

Depending on the nature of the product and the type of company the development process, starting with conceptualization and ending with introduction to the market will pass through several stages

Products development. In this phase the idea supplied by the marketing department are translated into a few concrete, but still relatively abstract. Functional design. Such designs describe the functions that the product to be developed will have to fulfill for the user. From these functional designs, the most promising design is selected to be elaborated further.

Product design. In this phase the functional design is worked out in detail – proposals are made about the materials to be used. The physical properties that the product must satisfy.

E t c. Often several products designs are produced which meet the functional design and these can be presented to potential clients at an early stage. In order to get the first reaction

and impressions concept testing. This information enables the engineers to focus on the most promising design. Subsequently the product design is elaborated in the form of prototype can also be presented to potential buyers and users.

Production planning. The manufacturability of the product has already been considered during the product design stage the production requirements are taken into account. After the prototype has been approved. Preparation for production can be started. If it concerns a technically complex products this phase may take a lot of time and it may be necessary to purchase new production equipment. The capacity requirements of this new equipment will have to be determined based on. Among other things, Market exploration and sale forecasts. Production planning frequently ends with a number of production series

Start of the production. Products from the pre production series are subjected to through examination: based on the result of this examination the product design or the setting of the machines might be adopted so as to limit future production and quality problems to a minimum. One of the problems that might occur in this phase is changing the specifications. Every change is documented in a change – order send by the engineering department to the purchasing department in order to discuss this with the supplier. This phase means a lot of work for the purchaser involved in the project.

Every change in the specification has to be approved by the supplier, the consequences for the total costs have to be analyzed, the change product needs to be tested again, etc. This is one of the reason why it takes so long for a new product to become available for customers. Only when the problem have been taken care of, can actual production commence.

It goes without saying it is possible to refine this sequence of steps, depending on the nature of the product and the type of company. As the development process advances, the specifications become more rigid and it becomes more difficult to introduce changes. The consequence for purchasing is that its latitude decreases and the cost of technical changes introduces at a later stage in the process become higher.

Once a suitable material or construction has been found, tested and approved, the willingness to consider any alternatives (in the form of a different material, component or a substitute product from another supplier) will be limited at a later stage. Any alternative will have to be tested and

approved again, which implies not only a lot of work but also risks. This desire to reduce technical risk may result in specific components being channeled in the direction of one particular supplier because of positive experiences with this supplier in the past.

The buyer is put in a difficult situation since it is awkward to negotiate with such suppliers. Based on his job perceptions, a buyer will always attempt to have more than one supplier to fall back on. For the buyer to go out into the market, the product preferably must be described in terms of functional specifications rather than in terms of supplier or brand specifications. There exists therefore, a kind of natural conflicts in the way the engineers and buyers operate which can only be solved by cross functional development teams.

4.3 Communications between buyers and first tier suppliers

Large manufacturers communicate with their first tier suppliers in product development as follows:

Purchasing engineering. This is a specialist function to provide the liaison between the engineering department and the purchasing department. Purchasing engineers are members of the design teams, where they will evaluate designs against purchasing-specific criteria. It is their task to bring in specific supply market knowledge and new supplier at an early stage of design.

Early supplier involvement (ESI) suppliers who have proved in the past to be 'best-in-class' are invited to participate in the company's development projects at an early stage. In this way they are able to criticize future designs, suggest alternative materials, come up with ideas for more efficient manufacturing, etc as a stage where engineering changes can be made without severe cost consequences.

Residential engineering. A next step is to co-locate engineers from the supplier on a more or less permanent basis within the organization in order to work on design or.

4.4 benefits of early supplier involvement

In accessing the benefits of early supplier involvement, companies need to differentiate between short-term and long-term benefits (Van Echtelt, 2004).

Short-term benefits may result from improved product quality, reduction of product cost, reduction of development time and reduction of development cost. These benefits result from the supplier's in-depth knowledge of components and technologies, which enables them to match component designs better with their manufacturing capabilities.

Long-term benefits may consist of more efficient and effective collaboration in future new product development projects, the alignment of future technology strategies, a better access to the technology resources of the supplier and the contribution of suppliers to product differentiation.

Involving buyers in development processes at an early stage can result in contribution of new knowledge and better understanding of:

- Construction
- Suitable materials
- Suppliers
- Supplier knowledge

Involving the supplier in new product development can also result in considerable savings.

The following shows the degree of design complexities with each of product design stage.

Product design stage	Degree of design complexity		
	Low (%)	Average (%)	High (%)
Initial design	2-5	10-25	30-50
Changing existing design	1-3	3-15	15-25
Redesign to improve quality	10	15-30	40-60



Review Questions

- i) *Describe the process of new product development*
- ii) *State the role of purchasing in new product development*
- iii) *Explain the conflicts that are likely to arise between engineering and other functions within the organization*
- e) *Discuss the design of new product stage and the degree of its complexities*

Suggested Further Readings

- i) Sudhi Seshadri (2005) *Sourcing Strategy: Principles, Policy and Designs*, PVT publishers, New Delhi
- ii) Elizabeth Anne Sparrow (2007), *Guide To Global Sourcing*, Prentice Hall, Chicago
- iii) Larry Paquette (2004), *Sourcing Solution*, Routledge, London
- iv) Handfield, R., Ragatz, G., Petersen, K., Monczka, R. (1999). *Involving suppliers in new product development. California Management Review.*
- v) Lakemond, N. Echtelt, F, and Wynstra, F. (Fall, 2001). *A configuration typology for involving purchasing specialists in product development. The Journal of Supply Chain Management.*

CHAPTER FIVE

THE PROCUREMENT PLAN



Learning Objectives

By the end of this chapter the learner should be able to:

- a) Define procurement plan*
- b) Explain the importance of procurement plan*
- c) Explain the process of establishing an effective strategic purchasing plan*
- d) Explain the factors that affects material planning*
- e) Describe the guidelines for materials planning*
- f) Describe the techniques of drawing up materials budgets*

5.1 Introduction

One of the most important aspects of inventory control is to have the items in stock at the moment they are needed. This includes going into the market to buy the goods early enough to ensure delivery at the proper time. Thus, buying requires advance planning to determine inventory needs for each time period and then making the commitments without procrastination.

For retailers, planning ahead is very crucial. Since they offer new items for sale months before the actual calendar date for the beginning of the new season, it is imperative that buying plans be formulated early enough to allow for intelligent buying without any last minute panic purchases. The main reason for this early offering for sale of new items is that the retailer regards the calendar date for the beginning of the new season as the merchandise date for the end of the old season.

For example, many retailers view March 21 as the end of the spring season, June 21 as the end of summer and December 21 as the end of winter.

Part of your purchasing plan must include accounting for the depletion of the inventory. Before a

decision can be made as to the level of inventory to order, you must determine how long the inventory you have in stock will last. For instance, a retail firm must formulate a plan to ensure the sale of the greatest number of units. Likewise, a manufacturing business must formulate a plan to ensure enough inventory is on hand for production of a finished product.

In summary, the purchasing plan details:

When commitments should be placed; ! When the first delivery should be received; When the inventory should be peaked; When reorders should no longer be placed; and When the item should no longer be in stock.

Well planned purchases affect the price, delivery and availability of products for sale.

5.2 What is a Procurement Plan?

A Procurement Plan defines the products and services that you will obtain from external suppliers. A good Procurement Plan will go one step further by describing the process you will go through to appoint those suppliers contractually. Whether you are embarking on a project procurement or organizational procurement planning exercise, the steps will be the same. First, define the items you need to procure. Next, define the process for acquiring those items. And finally, schedule the timeframes for delivery.

Procurement Plan helps the organization to procure products and services from external suppliers. It provides firms with a complete *project procurement* plan template, to help them to quickly and easily create a Procurement Plan for the business.

By planning procurement carefully, the firm can buy the right products for itself at the right price.

5.3 Importance of procurement plan

The Procurement Plan helps to:

Define your procurement requirements

Identify all of the items you need to procure

 Create a sound financial justification for procuring them

 List all of the tasks involved in procuring your products

 Schedule those tasks by allocating timeframes and resources

 Create a robust project procurement process for your business

Procurement Planning is critical if you want to get the most out of your supplier relationships. By using this Procurement Plan template, you can quickly and easily define your procurement requirements, the method of procurement and the timeframes for delivery.

5.4 Strategic purchasing plan

Manufacturers that plan, manage, and control their materials management and purchasing functions can significantly improve cash flow, profits, and customer satisfaction. A strategic purchasing plan can achieve these results. Establishing an effective strategic purchasing plan requires a manufacturer to undertake a five-step process of developing goals for improvement and monitoring its progress

I. Business Performance Measurement

The first step in developing a strategic purchasing plan is to establish and evaluate the company's materials management performance measurements and identify areas of potential improvement; for example, inventory turns and payable days as they relate to measurements of cash flow.

For every purchased product or service there is an opportunity for improvement in areas such as price, quality, service, delivery, consignment, and supplier-value added. Profit improvement goals should be established to reflect what is possible and not what is easily attained. Most organizations can expect to achieve a 20 to 60 percent improvement for each performance measurement, depending on the particular goal, the creativity utilized, and the company's commitment. It is important that current performance levels and goals for improvement are communicated to employees. In addition, suppliers should be advised of goals that affect them.

A good way to communicate these goals is to design a business performance measurement matrix

II. Organizational Strengths

Once the manufacturer has identified the areas it wants to improve, it must assess its organizational strengths to determine which assets will be needed to achieve those goals. Assets useful in strategic purchasing include material requirements planning software (MRP), business forecasting/budgeting methods, floor plans that promote timely communications, business teams, and cycle time compression.

One of the most important strengths a company has is its personnel. Every organization has employees who not only understand the need for improvement but can also convert goals into reality. Employees that can accept responsibility for project leadership and completion should be recruited to serve on cross-functional business teams that will pave the way for the rest of the company.

To get all employees involved in the improvement process, a manufacturer should implement a closed-loop management system that provides feedback to employees, encourages the setting of goals, and emphasizes the measurement of progress as it is made. This system can organize, train, and mobilize all employees with a focus on improvement.

Above all, the crucial element for success in any strategic purchasing plan is management's commitment to the process. A philosophical commitment is not enough—management must be ready to fully participate in the strategic purchasing plan. All employees will be asked to change the way they view the business and to develop a discipline of continuous improvement, and unless management actively participates and demonstrates its commitment, that change will not occur.

III. Supplier Integration

Suppliers are the single greatest underutilized business resource. Most manufacturers fail to see suppliers as an extension of their organization and don't share information with them. A company's suppliers share in its success and can be willing and valuable participants in the strategic purchasing plan.

Suppliers are experts in their particular businesses and have knowledge and expertise that can be valuable to the company seeking improvement. The manufacturer should inform current suppliers of the company's strategic purchasing plan, including the magnitude of improvement that is expected, and seek their input. It's also a good idea to contact suppliers that might want to increase their level of business with the company and give them the opportunity to participate.

Suppliers can contribute to a manufacturer's success in several ways:

- Assist in the forecasting of high dollar and long lead time

purchases. Results:

- supplier may commit to stocking materials
- improved on-time delivery
- reduced setup charges
- reduced transportation costs (e.g., emergency delivery)
- Identify areas of excessive specifications and other areas of high costs and provide input on lead time reduction.
- Aid in new product introduction.
- More accurate introduction lead times, estimated costs, and design/costs/specification relationships
- Reduced time-to-market cycle

IV. Strategy for Improvement

After investing considerable time and effort into identifying goals and assessing its organizational strengths, a manufacturer must devise an implementation strategy that will foster the success of the strategic purchasing plan so that its efforts will not be wasted. A good method of ensuring success is to begin the improvement process with the "low hanging fruit"-that is, choose a goal that is sure to be attained as the first step in the plan. When that goal is attained, it will gain momentum for the plan and inspire confidence among employees. It will also discredit any "doubting Thomases."

V. Measure the Results

To ensure success, a method of measuring progress toward goals must be established. Measurement is important because it creates discipline and a routine of improvement. It identifies those teams and employees who may require help and provides an opportunity to recognize and reward achievement. To support the momentum and enthusiasm necessary for success, incremental progress should be conveyed to employees.

A successful strategic purchasing plan is the result of a business that understands the magnitude of change required, has the conviction to commit to the change process, and utilizes the tools and

concepts of organized and controlled change management. As a result, the manufacturer will become financially stronger and more responsive to the marketplace, resulting in a larger market share.

5.5 MATERIALS PLANNING

Production planning is an area for top management decisions through which production plans, programmes and targets are spelled out. Production planning process starts well before the completion date so that sufficiently long time is given to the management to enable it to consider “alternative courses of action and authorize major commitments for materials, manpower, and plant facilities.”

Materials planning are a part of production planning. In fact for an effective inventory control, production plans should be converted into materials plans. This enables the management in clearly defining the quantity and schedule of the equipments. In the integrated materials arrangement, production and materials planning get a pride of place. Inventories consume a larger part of working capital. For best possible utilization of available capital resources, a material, planning is resorted to. It enables the management to anticipate the future materials demands. Such anticipation helps in managing the materials in a manner in which it enables the organization to accomplish the given objectives. Infact, materials planning provides a mechanism for inventory control.

Materials planning defined

“Materials planning” is the scientific way of determining the requirements of raw materials, components, spares and other items that go into meeting production needs within the economic investment policies.” As the definition goes, materials planning are a function and are a system which evolves methodology to plan the requirements of materials in a scientific manner. It is positively related with production which follows market conditions and sales forecasts. Further it cannot ignore the economy and the investment policy of the organization. These two factors also go side by side.

Factors affecting Material Planning

The following are the two factors which affect materials planning substantially:

1. The external Factors, and
2. The Internal Factors.

In economic terminology, external factors may be termed as macro factors which may be enumerated as under:

1. National Economy
2. Price Trends.
3. Monetary and Fiscal Policy of the Government:
 - (a) Credit Regulations,
 - (b) Direct and Indirect Taxes,
 - (c) foreign Exchange regulations,
 - (d) Import Policy, and
 - (e) International Market, etc.
4. Business Cycles, and
5. Other factors which usually fall under factors not within the reach of the organization, that is, uncontrollable factors.

The internal factors, affecting materials planning may be termed as micro factors or incorporate factors, are as listed below.

1. Corporate objectives and plans;
2. Technology available;
3. Market demand
4. Lead time and rejection rates
5. Working capital available
6. Nature of the inventory required and help;

7. Plant capacity and its utilization
8. Inventory levels;
9. Seasonal variations and market supply position;
10. Information and data available;
11. Delegation of power;
12. Communication system
13. Warehousing facilities available; and
14. Overall materials policy

5.6 Purchasing and Materials planning

Main job of purchasing personnel is to get materials when needed and pay for them as little as possible considering quality, quantity and other requirements and prices trends. It is the efficiency of the purchasing personnel which makes the real difference on the profit by the industrial unit as well as a commercial unit. Specific technical knowledge cost analysis; value analysis and good judgment go a long way in making a purchasing efficient.

But conservative thinking that purchasing function is an order – placing activity still holds good. The modern thinking is yet to penetrate and wipe off the outside manufacture and hence we have to view it from materials planning point of view. This takes for granted a closer tie between purchasing and other functions. A close liaison between other departments of the organization on the one hand materials department is a prerequisite for an effective materials planning. For smooth and an interrupted operation of the organization, it is necessary that every – one in the organization should be actively involved in the attainment of the objectives of the organization. It is this involvement which is important for any effective material planning since all the departments of the organization are somehow or other related to what is required and procured for the efficient running of the whole organization.

Here, we are faced with an awesome question: “in view of the wide diversity of responsibility(of the purchasing personnel)...., is it possible to formulate any unified procedure o the basis of

which we may determine what is considered to be the escape of the purchasing for materials planning?”

Certainly it is possible. What is required is that we should follow well recognized principles of sound purchasing procedures, which are listed below.

1. The ascertainment of the need,
2. an accurate statement of the character and the quantity of goods desired,
3. The transmission of requisition,
4. Negotiation for possible sources of supply,
5. Analysis of the proposed purchase, selection of Vendors and placing of the supply order,
6. the follow up of the order,
7. The checking got the invoice,
8. The receipt and inspection of goods delivered, and
9. Completion of the records.

For any effective materials planning, it is necessary that purchasing functions should be well – organized and the department should follow well – recognized principles. Materials planning should be such which may enable the materials manager to cope with the demand for materials and as when it comes to him. Materials are basic to profitability. Raw materials, purchased materials and other supplies are cost centre of the demand for materials planning is done in close co-operation and consultation with the purchasing department is we- equipped with the economies of purchasing. Hence, materials planning may carry meaning and prove result – yielding if purchasing department of the organization is actively associated at all the stages and at all the levels.

5.7 TECHNIQUES OF MATERIALS PLANNING

The under mentioned two techniques are usually used for materials planning:

1. Bill of Materials Technique, and

2. Past consumption Analysis Technique.

Bill of Materials Technique

A bill of materials indicates the name, part, and usage of each component and the sub-assembly in which it is to be used. Each product has a bill of materials since each of the products has its own equipments dependent on its design and according to the engineering designs and the components consisting of standard parts need for particular product to be manufacture. If a chair is to be prepared it can be split into (i) legs (ii) arms, (iii) seat, (iv) back rest. Each of the parts of the chair will have separate specifications and naturally each may have its own manufacturing design. According to the specifications and design, the bill of materials will be drawn on such composite information for the product – the chair in this case. In a bill of materials for a product, the components required may be procured according to the specifications.

When any of the units of the organization receives a work order or production programme is finalized, the concerned foreman prepares a list of all the materials required for the execution of the order or manufacturing of the product as per production programme. The list of materials so prepared is known as a bill of Materials which includes all the details as regards to quality, quantity, code number, and other necessary specifications, etc.

Once the production programme is finalized, each product is exploded (split) into its basic requirements with the help of it's of materials. The number required per item is multiplied by the number to be produced in order to arrive at the total requirement. The total requirements are further adjusted for various losses. Rejections should also be provided for. Every care should make for them. Provisions for stock and lead time consumption should be made. Taking all these provisions into consideration the bill for materials should be drawn for each component and then through multiplication process total requirement should be obtained.

The bill of materials – known as BOM – is the simplest technique of materials planning .BOM with required lead -time and necessary contingency provisions is drawn which eventually turns into indents for procurement. it also acts as a guide to delivery and inventory requirement. BOM, therefore, helps in keeping watch over the delivery of matching equipments, spare part, and components and also over materials directly going into production. It enables the evaluation of the progress of the project undertaken and ensures the flow of need materials. Such an avoidance of

capital blockage saves and diverts the working capital and reduces the inventory carrying cost to a larger extent.

Explosion of Bill of materials

Explosion of bill of materials refers to splitting of the requirements for the product to be manufactured into its basic components; then by multiplication process we get the total equipments. This is very effectively done with the help of “demand forecasts”. As we have seen earlier, the very basis for material planning is the forecast of demand for the end products. For calculation of equipments for various materials, explosion charts, are conveniently used by the materials department. An explosion chart is a series of bills of materials grouped together by combing the requirements for a particular end – product or group of end – products. The above discussion may best be explained with help of the following chart;

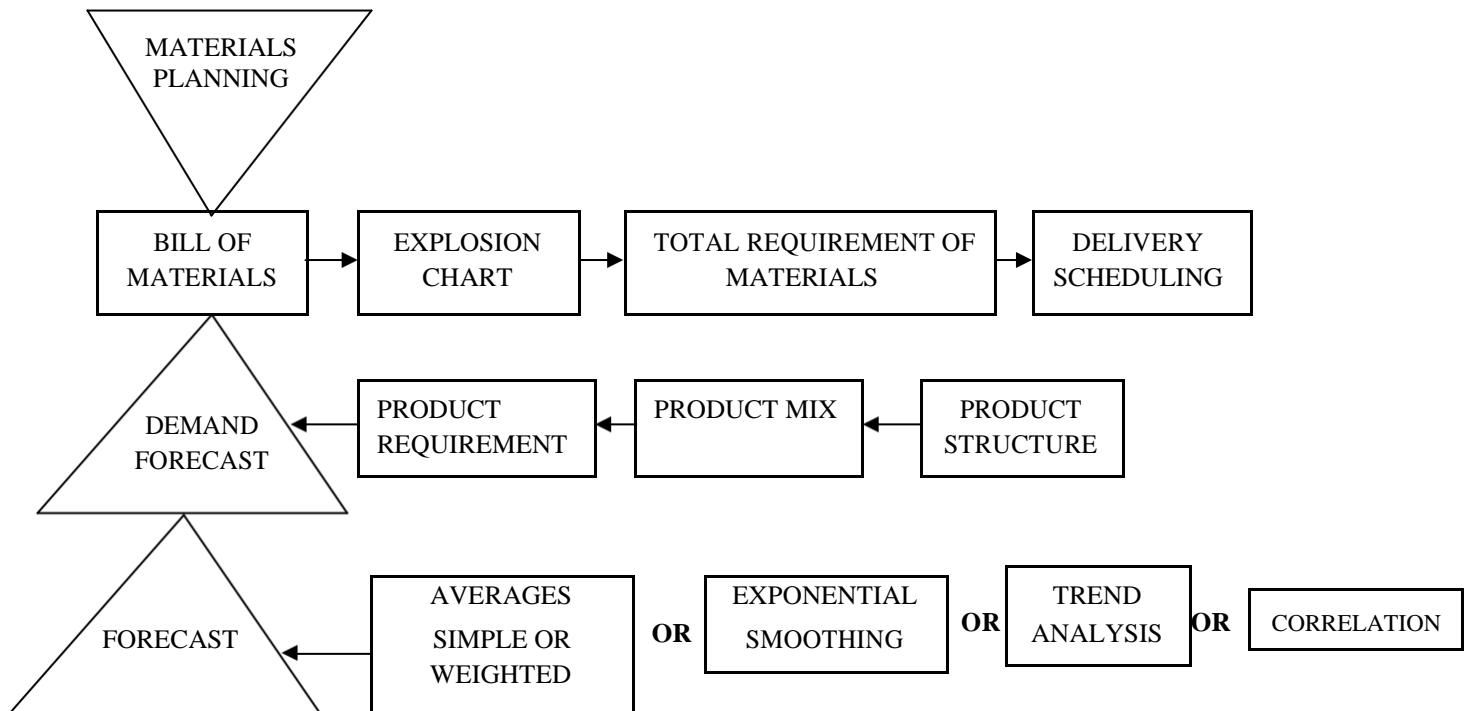


Fig Materials planning through BOM

Period and Suitability of BOM Technique

Bill of materials technique is ideally suited to engineering industries – both heavy and light in case where large numbers of components are required for manufacturing or assembling and end-product which certainly required from various sources, which, as we have seen, is a convenient method of knowing the total requirements for an end product.

There may be controversy so far as the period is concerned. It may vary from a month to a year depending upon the reliability of information and forecasts made. A forecast tends to become less reliable as the period goes on increasing.

Forecasts amply prove that they are reliable only to the extent to which the information and data are reliable. If prejudices and personal pride has not crept in and the fed data are nearly absolute, unbiased, and are based on sound judgment, then the forecasts may serve the purpose well and period may even exceed one year. But seldom had these conditions adequately fulfilled.

It is because of this reason that ideal period for materials planning are advocated to be of three months. Planning on a quarterly basis is also safe in the present state of Kenyan economy in which inflationary pressure is upsetting all calculations and market conditions are far from satisfactory from both demand and supply points of view.

Owing to error in forecasting or change in the market conditions and the national or state policy the materials (either all or some of them) may either be in short supply or in excess. This surely would upset the plans, programmes and schedules. A materials planning done on a quarterly basis may rectify the errors, apply the correctives and bring the operation on the right track which in case of annual (or more) planning is rather difficult, if not altogether impossible.

Past Consumption Analysis Technique

Where materials are consumed on continuous basis, the technique of past consumption analysis for materials planning is conveniently used by the organization. According to this technique, future projection is made on the basis of the past consumption data, which is analyzed taking into account the past as well as future production plans. Statistical tools like mean, median, mode and standard deviation are used in analyzing the past consumption, projecting the future and tackling mild as well as wild fluctuations in consumption.

This technique can be successfully used in process industries. This technique can be fruitfully used for materials being used on continuous basis for which no straightforward norms of consumption can be easily worked out in the organization, and also for those materials which are either used directly or indirectly in the production process.

5.8 SOME GUIDELINES FOR MATERIALS PLANNING

Though for every organization guidelines cannot be provided in a limited treatise like the present one but some of the general guidelines can be given which can be kept into mind and effectively used by a materials planner for effective and reliable planning.

1. A long lead time

Lead time should be kept as long as possible to provide cover for the unforeseen circumstances which may crop up during the planning period.

2. Analysis of operating environment

Careful analysis of operating environment of the firm is a must in order to guard against possible demand fluctuations and seasonal variations.

3. A shorter plan period

A shorter materials plan period ensures reliability. Fortnightly or monthly materials plan period is an ideal one. However, in Kenya quarterly plans are popular though a quarter is not considered to be a shorter period for a materials plan this is shorter one. For a quarterly materials plan analysis of operating environment becomes more or less a necessity. Also lead time calls for proper scrutiny and sound judgment.

4. Computerization

Computerization of materials planning process saves time and energy and helps in accurate forecasting. A system effecting saving in time and energy and offering better scope for accurate forecasting is naturally ideal for any materials planning particularly when materials planning are being done in adverse conditions and where economy is fast changing and is not conducive to desired and healthy growth of industries, trade and commerce. In such an economy one is required to handle wild demand fluctuations, and a materials manager, in such a situation, is left with no alternative but to revise his materials plans off and on with every demand fluctuation and change

in economic situation. Here computerization of materials planning process comes to the rescue of a materials planner. Computerization of the process may help in effecting a change even within the shortest period of 24 hours. Obviously computerization goes a long way in proving the utility of materials planning and its fruitfulness in production planning programming and scheduling.

5.9 MATERIALS BUDGETING

A budget is a co-ordinated financial estimate of the income and expenditure of an organization related to a specified future period. It may be defined as “Budget is a plan of action quantified in money terms for some future period”

A budget serves the following purposes:-

- (i) Planning the activities of various departments,
- (ii) Controlling such activities of the departments
- (iii) Fixation of objectives and targets of all such activities of the departments
- (iv) Closely watching the performance of various departments
- (v) Detection of deviations etc, if there is any and
- (vi) Application of correctives so as to help in achieving the objectives and targets.

Materials budgets

A materials budget is coordinated estimate of the consumption and purchases of materials in an organizations relating to a specified period. The purpose of a materials budget is:-

1. To plan and control purchases
2. To assess and make a provision for the financial requirement of such purchases
3. To plan and control the production schedule.
4. To watch the activities of the purchases and materials control departments.
5. To suggest ways and means of improvements in the next budget estimate.

Factors governing drawing up of a materials budget

The following are the main factors which govern drawing up a materials budget

- (a) The past rate of consumption and its ratio with production. The rate of consumption plays a vital role in framing a materials budget since it is a factor which gives two important points for careful study so as to help forming correct estimate of materials for the ensuing period that is
 - (i) period-to-period consumption of materials in relation to production programme and the product produced. And
 - (ii) period-to-period investment made. The ratio of consumption and consequent production is also important as it helps in taking a decision on the future course of action, particularly production planning, purchases and sales planning which are directly dependent on this ratio.
- (b) The production programme of the future specified period for which the materials budget is intended. Production programme is obviously one of the important factors of the materials budget. It is the very basis of a materials budget. No one can plan anything or estimate a future course of action unless he is in the know of the objectives and targets to be achieved. And for achieving the target a budget is required. The rate of consumption may remain more or less the same for a labourer or a machine, but it often varies with the variance in production programme. The rate of consumption is directly related to the production programme which one has set for oneself and a materials budget is governed and guided by this factor to a great extent.
- (c) The financial burden and investment pattern. No amount of good intention on the part of production programmes will help them in achieving targets and objectives unless backed by a good financial commitment and a well-set out investment pattern. The main task of the framers of materials budget is to allocate available funds in a manner in which maximum value is extracted from them without disturbing the production programme. Here the efficiency of the framers is put to test and the very success of a budget depends on the proper allocation of funds. The means in every organization are scarce and the uses numerous. Tactful and intelligent utilization will lessen the financial burden and set out a well-planned and effective investment pattern.

- (d) The materials cost. This factor too affects the materials budget in the sense that it directly influences the financial commitment of the organization. A study, therefore, of the cost trend of the materials is required. Future trend has also to be studied and incorporated while preparing a materials budget.
- (e) The demand and supply curve. Here also study of market conditions pertaining to the demand and supply trend is to be made before venturing to draw up a materials budget as the production schedule and financial commitments have to be adjusted according to the trend in the market. A forecast, correct one, may for a long way in achieving the purpose of materials budgeting. While setting a demand curve due care should be taken of the storage loss due to circumstances beyond human control, such as floods, transport bottlenecks, war etc.

5.10 Materials budgeting and accounting

From the above it is evident that accounting has to play a very important role in materials budgeting. The adequate help of cost and stores accounting by way of providing up to-date, reliable and required data to the materials control department enables it to base its forecasts on the data so supplied. The cost and stores accounting are both to supply the required information. Both of them are complementary to each other in this respect. To watch the performance and to suggest corrective measures, the help of accounting has to be taken. Hence accounting and materials budgeting together for achieving the set objectives of the organization.

Materials' budgeting helps in controlling the cost and thus makes the organization cost conscious. Cost consciousness in turn makes the organization productivity conscious. Every material requisition is considered according to its necessity, every man-hour is utilized to its fullest capacity and every shilling spent is made to prove its worth. This is achieved through cost and result analysis which is possible only through accounting. Since materials budgeting aims at cost reduction, accounting again comes to the fore for making the budget result, producing.

Techniques of drawing up materials budgets

One of the following positively correlated techniques is generally made use of for drawing up a materials budget

- a) Budget summaries

- b) Manufacturing and trading account
- c) Savings on investments in materials

Budget summaries

Budget summaries are summaries of various individual budgets of the organizations. They placed in proper relationship with one another. They are viewed and analyzed and help is taken from them in arriving at a certain conclusion for the purpose of incorporation of a figure in a budget estimate. A material budget is grown up in relation to production, sales and purchase budgets. Budgets summaries help in correlating each one of them in broader perspective as budget summaries, usually accompanied by reports, which at a greater length, deal with the variances and their reactions, and are helpful in drawing conclusion for the next budget estimates.

The merits of the technique

- (a) Budget summaries are concrete numerical standards which provide a good base for the next budget estimates
- (b) Budget summaries describe the position briefly and are arranged in such and analytical and comparable form that they help in drawing conclusions correctly.
- (c) Budget summaries throw light on the activities of various departments. This makes planning effective. Also objectives get correct definition. Thus implementations part of the budget estimates becomes an easy task.

The limitations of the technique

- a) Budget variations are always there. The variations may be of minor as well as of major nature. Budget summaries may give equal importance to both types of variations which ought not to have been treated on equal terms. The conclusions and consequently, next budget estimates may give a picture which may not be a true one.
- b) Budget figures are often manipulated so as to balance the requirements and funds available. This may result in faulty conclusions and thus the next budget estimate may also become faulty. In such cases, budgetary control may also be a troublesome and irksome job.

- c) Budget summaries are merely numerical standards. They speak only about estimates and a little bit of performance, but they do not ensure profitable operations. No clear picture thus emerges from budget summaries so far as the profitable operation the business is concerned.

Manufacturing and trading account

This technique is comparatively result-oriented as it is based on the performance of the budget vis-à-vis the results. This account reveals in detail various items relating to the opening stock purchases expenses on purchases, production, closing stock, working –in-progress, etc, and finally the cost of production and profit made out of manufacturing and trading process. This account is a good base, rather a good applied technique for budget estimates. Of course, budget summaries cannot be done away with. The positive help such summaries are of immense value for the framers of materials budget.

The merits of the technique

- a) This technique is result-oriented and thus a good base for budget estimates
- b) It stresses profitability aspect on each of the correlated budgets of the various departments. Thus efficiency and performance become the keynote of various budgets.
- c) Pro rata analysis of the result is possible. Thus periodical and flexible budgets become a possibility.

The limitations of the technique

- a) It involves much paper work and thus becomes too heavy a burden for an organization of relatively small size.
- b) There may be cases in which proper allocation of expenses to one or other of the items may not be feasible. Wrong inferences, thus may be drawn.
- c) The result-oriented budget framing technique may result in interdepartmental rivalry which ultimately may not prove to be good for the organization as a whole.

Savings on investments in materials

The overall performance of an organization can be judged by the profit it has made during a specified period and a budget is a means to setting the objective of profit-making in a right perspective through its estimates based on returns on investment. The materials budget consumes the major portion of funds available in the organization; hence it is appropriate to measure the performance of materials budget by finding out the savings on the investments made in the past and possible expected savings in future. The amount of savings achieved by any materials budget effectively is the success of any materials budget and this can be better judged by the ratio of savings and investment in materials.

The ratio of savings achieved to total investment as budget may be analyzed on the basis of the following equations.

$$\frac{\text{Saving}}{\text{Investment}} = \frac{\text{Savings}}{\text{Value of materials utilized}} \times \frac{\text{Value of materials utilized}}{\text{Investment}}$$

Or

$$\frac{\text{Value of products} - \text{cost of products}}{\text{Value of materials utilized}} = \frac{\text{Value of materials utilized}}{\text{Investment}}$$

The merits of technique

- a) Objectives are clearly defined, which give a realistic approach in materials budgeting.
- b) It can also be effectively used in other inter-related departments
- c) As detailed analysis is possible, a remedial action for disturbing trends may be taken.
- d) It makes possible the effective use of scarce means available to the organization.

The limitations of the technique

- a) It lays too much emphasis on the financial aspects. Other important factors which may curtail the investment and achieve savings are not taken care of.
- b) The savings so arrived at are based on past performances. Future budgeting is based on calculations. But the circumstances in which the savings are achieved may not be present in the budget year in question. The result, thus, may be misleading.
- c) Much paper work, labour and calculations are required, but they may not worthwhile for a small-sized business.

Before choosing any one of the techniques discussed above, the framers of materials budget should take into consideration the points enumerated below.

- i. The objective and policies of the organization. Budget is a means and not an end in itself, hence a well defined objective and policy will ensure effective materials budgets, otherwise, it will simply be a waste of time, money and energy.
- ii. The period of budget: budget, whether material or any other, may be of short term or long term. Generally, a materials budget is of short term. The short term may also be of three months, six months or even one year. This makes a materials budget more effective and result producing.
- iii. The data available. As has been discussed in the foregoing pages, the data, if available as required, may make or mar the success and the effectiveness of a budget. In all the three techniques discussed above the availability of reliable, perfect, up-to-date and analytical data is very essential.
- iv. Flexibility of budget. The flexibility of budget, particularly materials budget, is one of the important points to be taken note of. The materials are subject to various kinds of losses during the storage process, their demand may increase or decrease according to changes in the production schedule. This requires flexibility so as to make adjustments according to circumstances.
- v. Repetition of past targets. Business is a growing and going venture. Repetition of past targets in any budgetary provision is always in bad taste. It reflects the unconcerned

attitude of those who are responsible for running the organization. A change towards betterment should always be the motto of the framers of any kind of budget.

Purchasing Plan and Materials Budget can only be fixed to the accuracy of Sales and Production Forecasts - normally not accurate to annual basis but requirement adjustment throughout the production year

Materials Budget contains information concerning:

- Estimated materials prices for the period
- Timing of purchases to establish obligation rates for the period .

Forward buying can be arranged commensurate with planning levels and accuracy.

- Forward buying attempts to purchase quantities to levels approximating foreseeable requirements.
- "Hand to Mouth" buying is buying material to satisfy current operating requirements, oftentimes at less than optimum economic quantities.

Forward buying consists of advanced arrangements such as:

- Blanket Purchase Agreements
- Contract Purchases (IDIQ, Requirements, etc.)

Long term forward buying arrangements should include provisions to mitigate risks associated with market volatility (swings either upward, to protect supplier, or downward, to protect buyer)

Market Stability influences purchase timing

- Stable markets may allow orderly purchases of uniform quantities
- Unstable markets may provide opportunities to be either seized or avoided
- Proper market timing can be a hedge against rising prices of commodities

Volume purchased can influence prices (and also the cost of capital) while avoiding the negative impact of numerous small purchases. Acquisition strategy and contract type are important here.

It is important to emphasize that Strategic Materials Planning considers long-term material requirements and market projections

- In strategic materials planning, the focus is on the corporate position over the long haul, not short term gratification
- Potentially critical materials for future needs are identified and sources developed
- Consumer demand and product/materials innovation must be considered
- Political and economic environments in source countries must be assessed
- Competitor demands for like commodities must be considered
- Strategic materials planning should maximize benefits derived from second or alternative sourcing agreements by injecting competition, ensuring product availability
- Materials projected in short supply should be considered for substitution/replacement and vice versa
- Make or buy decisions should be included where outsourcing of components is a concern or potentially risky



Review Questions

- a) Define procurement plan*
- b) Explain the importance of procurement plan*
- c) Explain the process of establishing an effective strategic purchasing plan*
- d) Explain the factors that affects material planning*
- e) Describe the guidelines for materials planning*
- f) Describe the techniques of drawing up materials budgets*

References

- i) Arjan Van Weele (2004), *Purchasing and Supply Chain Management*, PVT publishers, New Delhi
- ii) Benton W C (2007), *Purchasing and Supply Management*, Routledge, London
- iii) Michael Quayle (2005), *Purchasing and Supply Chain Management: Strategies And Realities*, Routledge, London
- iv) Saleemi,N.A, stock control Saleemi publishers ,Nairobi

SAMPLE PAPERS

DEPARTMENT OF BUSINESS AND SOCIAL STUDIES

Main Examination - May - August, 2010

SPM 311: GENERATION OF REQUIREMENTS

Time: 2 Hrs

Instructions to Candidates: Answer question 1 (Compulsory) and any other TWO questions.

QUESTION 1

- a) Explain the importance of procurement plan (4mks)
- b) State the role of purchasing in new product development (6mks)
- c) Discuss why firms outsource (8mks)
- d) Identify items to be standardized (4mks)
- e) Write short notes on the following:
 - Standards (4mk)
 - Simplifications (4mks)

QUESTION 2

- a) Discuss the basic issues in make or buy decisions (12mks)
- b) Explain the motives of outsourcing under:
 - Focus on core competence. (4mks)
 - Focus on cost efficiency/effectiveness and (2mks)
 - Focus on service (2mks)

QUESTION 3

- a) Explain various types of standards classifications (10 mks)
- b) Discuss the importance of standardizations and simplifications (10mks)

QUESTION 4

- a) *Describe the process of developing a good purchasing descriptions* (15mks)
b) *Discuss various approaches to specifications* (5mks)

QUESTION 5

- a) Explain the process of establishing an effective strategic purchasing plan (12mks)
b) *Explain the factors that affects material planning* (8mks)

DEPARTMENT OF BUSINESS AND SOCIAL STUDIES Special/Supplementary
Examination - May - August, 2010 SPM 311: GENERATION OF REQUIREMENTS

Time: 2 Hrs

Instructions to Candidates: *Answer question 1 (Compulsory) and any other TWO questions.*

QUESTION 1

- a) Differentiate between turnkey and partial outsourcing (8mks)
- b) *Explain the conflicts that are likely to arise between engineering and other functions within the organization* (6mks)
- c) *Explain how simplifications are achieved* (6mks)
- d) Explain factors found by McQuiston to be core to a successful outsourcing relationship (6 mks)
- e) Identify the components of purchase descriptions (4mks)

QUESTION 2

- a) *Explain methods of communicating material needs* (10mks)
- b) Describe the purchase descriptions flow (10mks)

QUESTION 3

- a) *Describe the process of new product development* (12mks)
- b) Discuss the design of new product stage and the degree of its complexities (8mks)

QUESTION 4

- a) *Describe the guidelines for materials planning* (10mks)
- b) *Discuss the techniques of drawing up materials budgets*
(10mks)

QUESTION 5

- a) *Explain the methods of standardization* (10mks)
- b) Highlight factors to be borne in mind while utilizing standards (10mks)