**UNIT FIVE**

**Relevant Information and decision making**

**5.1. INTRODUCTION**

During the last decade, increasing competition has forced many companies to refocus their resources and to defend their core businesses against aggressors. In developing strategies to fight this war, managers have generally reached a consensus on two strategic criteria. First, to win a battle, the focus of organizations must be on delivering products and services in the manner most consistent with the desires of customers. Second, no company can do all things well. The strategies managers devise in this intensive struggle evolve from internal evaluations in which the managers identify the functions they must do well to survive. These functions are regarded as core competencies and maintaining leadership in these areas is regarded as vital. All other functions, although important to the organization, are regarded as noncore functions. By intensely focusing on core functions, managers try to maintain a competitive advantage. However, an undesirable consequence of focusing on only the core competencies is that the quality and capabilities of the noncore functions can deteriorate. This deterioration, in turn, can reduce a firm’s ability to attract customers to its products and services. Outsourcing the noncore functions to firms that have core competencies in those functions frequently solves the dilemma of maintaining a focus on core competencies while also maintaining excellence in noncore functions. Managers are charged with the responsibility of managing organizational resources effectively and efficiently relative to the organization’s goals and objectives. Making decisions about the use of organizational resources is a key process in which managers fulfill this responsibility. Accounting and finance professionals contribute to the decision-making process by providing expertise and information. Accounting information can improve, but not perfect, management understands of the consequences of decision alternatives. To the extent that accounting information can reduce management’s uncertainty about economic facts, outcomes, and relationships involved in various courses of action, such information is valuable for decision-making purposes. Many decisions can be made using ***relevant costing,*** which focuses managerial attention on a decision’s relevant (or pertinent) facts. Relevant costing techniques are applied in virtually all business decisions in both short-term and long-term contexts. This chapter examines their application to several common types of business decisions: replacing an asset, outsourcing a product or part, allocating scarce resources, determining the appropriate sales/production mix, and accepting specially priced orders. In general these decisions require a consideration of costs and benefits that are mismatched in time; that is, the cost is incurred currently but the benefit is derived in future periods. In making a choice among the alternatives available, managers must consider all relevant costs and revenues associated with each alternative

**5.2. INFORMATION AND THE DECISION PROCESS**

Decision making is the process of choosing the best course of action from alternatives available. Decision model is a method used by managers for deciding among courses of action. Accounting information (revenue and cost information) are basic inputs in to decision model. However, other quantitative as well as qualitative information can also be used. In general information is divided in to relevant and irrelevant information. Relevant information is information which is useful for decision making where as irrelevant information is not useful for decision making. The management accountant’s role in the decision making process is to produce relevant information to the managers who make the decisions. Thus, the primary role of cost accountant in decision process is to: decide what information is relevant to each decision problem, and provide accurate and timely information (data)

Decision making process involves basically the following activities.

**i. *Identify and Define the Problem.*** The most important phase of decision making process because all other activities in the process depend on this phase. Incorrectly defined problems waste time and resources. That is why it is usually said that defining a problem is solving half of the problem.

**ii. *Specify the Criterion.*** The phase in which the purpose of decision is to be made. Is the objective to maximize profit, increase market share, minimize cost, or improve public service? For example, cost minimization, increase the quality of product, maximize profit, etc.

**iii. *Identify Possible Alternatives***: Determining the possible alternatives is a critical step in the decision process.

**iv. *Gathering Relevant Information*.** Information could be subjective or objective, internal or external to the organization, historical (past) data, or future (expected) ones.

**v. *Making the Decision:*** Select the best alternative (course of action).

**5.3. THE CONCEPT OF RELEVANCE**

For information to be relevant, it must possess three characteristics. It must (1) be associated with the decision under consideration, (2) be important to the decision maker, and (3) have a connection to or bearing on some future endeavor.

**Association with Decision**

Costs or revenues are relevant when they are logically related to a decision and vary from one decision alternative to another. Cost accountants can assist managers in determining which costs and revenues are relevant to decisions at hand. To be relevant, a cost or revenue item must be differential or incremental. An ***incremental revenue*** is the amount of revenue that differs across decision choices and ***incremental cost (differential cost)*** is the amount of cost that varies across the decision choices.

 To the extent possible and practical, relevant costing compares the incremental revenues and incremental costs of alternative choices. Although incremental costs can be variable or fixed, a general guideline is that most variable costs are relevant and most fixed costs are not. The logic of this guideline is that as sales or production volume changes, within the relevant range, variable costs change, but fixed costs do not change. As with most generalizations, some exceptions can occur in the decision-making process.

 The difference between the incremental revenue and the incremental cost of a particular alternative is the positive or negative incremental benefit (incremental profit) of that course of action. Management can compare the incremental benefits of alternatives to decide on the most profitable (or least costly) alternative or set of alternatives.

 Some relevant factors, such as sales commissions or prime costs of production, are easily identified and quantified because they are integral parts of the accounting system. Other factors may be relevant and quantifiable, but are not part of the accounting system. Such factors cannot be overlooked simply because they may be more difficult to obtain or may require the use of estimates. For instance, ***opportunity costs*** represent the benefits foregone because one course of action is chosen over another. These costs are extremely important in decision making, but are not included in the accounting records.

**Importance to Decision Maker**

 The need for specific information depends on how important that information is relative to the objectives that a manager wants to achieve. Moreover, if all other factors are equal, more precise information is given greater weight in the decision making process. However, if the information is extremely important, but less precise, the manager must weigh importance against precision.

**Bearing on the Future**

 Information can be *based* on past or present data, but is relevant only if it pertains to a future decision choice. All managerial decisions are made to affect future events, so the information on which decisions are based should reflect future conditions. The future may be the short run (two hours from now or next month) or the long run (three years from now). Future costs are the only costs that can be avoided, and a longer time horizon equates to more costs that are controllable, avoidable, and relevant. *Only information that has a bearing on future events is relevant in decision making.*

Costs incurred in the past for the acquisition of an asset or resources are called sunk costs. They cannot be changed, no matter what future course of action is taken because past expenditures are not recoverable, regardless of current circumstances. Thus, the historical cost is not relevant to the decision.

***Example5.1*** Marina Company, a manufacturer of a line of ashtrays, is thinking of using aluminum instead of copper in the manufacture of its product. Historical direct material cost was Br. 0.50 per unit. The company expected future costs for aluminum is Br 0.40 and it is unchanged for copper. Direct labor cost were Br0.80 per unit and will not be affected by the switch in materials.

The analysis in a nutshell is as follows:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Copper** | **Aluminum** | **Difference** |
| Direct material | Br 0.50 | Br 0.40 | Br 0.10 |
| Direct labor |  0.80 |  0.80 | - |

 In the foregoing analysis, the material cost (the expected future cost of copper compared with expected future cost of aluminum) is the only relevant cost. The material cost met both criteria for relevant information. That is, bearing on the future and an element of difference between the alternatives. However, the direct labor cost will continue to be Br 0.80 per unit regardless of the material used. It is irrelevant because the second criterion – an element of difference between the alternatives – is not met.

***Example5.2*** Consider a decision facing Home Appliances, a manufacturer of vacuum cleaner, whether to “reorganize” or “do not reorganize” its manufacturing operations to reduce manufacturing labor costs. The reorganization will eliminate all manual handling of materials. The current manufacturing line uses 20 workers- 15 workers operate machines and 5 workers handle materials. The 5 material-handling workers have been hired on contracts that permit layoffs without additional payments. Each worker puts in 2,000 hours annually. The cost of reorganization (consisting mostly of equipment leases) is predicted to be Br. 90,000 each year. The predicted production and sales of output of 25,000 units will be unaffected by the decision. Also unaffected are the predicted selling price of Br. 250, the direct materials cost per unit of Br. 50, MOH of Br. 750,000, and marketing costs of Br. 2,000,000. Historical labor costs were Br. 14 per hour. A recently negotiated increase in employee benefits of Br. 2 per hour will increase labor costs to be Br. 16 per hour in the future.

***Required:*** Should Home Appliances reorganize its manufacturing operations to reduce manufacturing labor costs?

Solution:

 *The comparative statement of for the given alternative*

 *All Data Relevant Data*

 *Do Not Reorganize Reorganize Do Not Reorganize Reorganize*

Revenues: 250 X 25,000 Br. 6,250,000 Br. 6,250,000 - -

Costs:

DM: 50 X 25,000 1,250,000 1,250,000 - -

DL: 20 X 16 X 2,000 640,000 Br. 640,000

 15 X 16 X 2,000 480,000 Br. 480,000

MOH: 750,000 750,000 - -

Marketing 2,000,000 2,000,000 - -

Reorganization costs - 90,000 - 90,000

Total costs Br. 4,640,000 Br. 4,570,000 Br. 640,000 Br.570, 000 Operating Income **Br. 1,610,000 Br.1, 680,000 Br. (640,000) Br. (570,000)**

 Br. 70,000 Difference Br. 70,000 Difference

In the above statement, the financial data underlies the choice between the do not reorganize and reorganize alternative. The first two columns present all data. The last two columns present only relevant costs…the Br640, 000 and Br 480,000 expected future manufacturing labor costs and Br 90,000 expected future reorganization costs that differ the between two alternatives. The revenues, direct materials, manufacturing overhead, and marketing items can be ignored because they do not differ between the alternatives and, therefore, are irrelevant.

And, also note that, the past (historical) manufacturing hourly wage rate of Br 14 and total past(historical) manufacturing labor costs of Br 560,000 (20 workers X 2,000 hours per worker per year X Br 14 per hour) do not use in solution, because historical costs themselves are past costs that, therefore, are irrelevant to decision making.

The analysis, in above solution, indicates that reorganizing the manufacturing operations will increase predicted operating income by Br, 70,000 each year and we reached the same conclusion whether we use all data or include only relevant data in analysis.

* 1. **RELEVANT INFORMATION FOR SPECIFIC DECISIONS**

Managers routinely choose a course of action from alternatives that have been identified as feasible solutions to problems. In so doing, managers weight the costs and benefits of these alternatives and determine which course of action is best. Incremental revenues, costs, and benefits of all courses of action are measured against a baseline alternative. In making decisions, managers must provide for the inclusion of any inherently non quantifiable considerations. Inclusion can be made by attempting to quantify those items or by simply making instinctive value judgments about nonmonetary benefits and costs.

In evaluating courses of action, managers should select the alternative that provides the highest incremental benefit to the company. Rational decision-making behavior includes a comprehensive evaluation of the monetary effects of all alternative courses of action. The chosen course of action should be one that will make the business better off. Decision choices can be evaluated using relevant costing techniques.

**5.4.1. Special Order Decisions**

One type of decision that affects output level is accepting or rejecting aspecial order. A special order is a one-time order that is not considered part of the company’s normal ongoing business. In general, a special order is profitable as long as the incremental revenue from the special order exceeds the incremental costs of the order. Thus, conditions to consider in a special orderdecisions are: (i) Customers must be from markets not ordinarily served by the company, and (ii) the company must operate below it maximum productive capacity

***Example5.3****.*Consider the following details of the income statement, on absorption costing basis (that is, both variable and fixed manufacturing costs are included in inventoriable costs and cost of goods sold), of Samson Company for the year just ended December 31, 20X4

|  |
| --- |
|  Total per unitSales (1,000,000 units) Br 20,000,000 Br 20 Cost of Goods Sold 15,000,000 15 Gross Margin Br 5,000,000 Br. 5 Selling and Administrative Expenses 4,000,000 4 Operating Income Br. 1,000,000 Br. 1 |

Samson’s fixed manufacturing costs were Br 3 million and fixed selling and administrative expenses were Br 2.9 million. Near the end of the year, Ethio Company offered Samson Br 13 per unit for 100,000 unit special order. The special order would not affect Samson‘s regular business in any way. Furthermore, the special sales order would not affect total fixed costs and would not require any additional variable selling and administrative expenses.

***Required:***

1. Should Samson accept or reject the special order?
2. Could the special order affect Samson’s regular business?

**Solution:**

a). The correct analysis to the above problem employs the contribution approach to income statement, not the absorption or financial approach- that treats fixed costs, i.e., fixed manufacturing costs as if it were variable.

* Variable manufacturing cost per unit═ 15,000,000 - 3,000,000 ═ 12per unit

 1,000,000

* Total Variable manufacturing cost ═ Br. 12 x 1,000,000 ═ Br.12,000,000
* Variable selling and administrative cost per unit═4,000,000 -2,900,000═1.1per unit

 1, 000, 0000

* Total Variable selling and administrative cost ═ Br. 1.1 x 1, 000, 0000 ═ Br.1,100,000( the special order does not affect this cost)

The analysis would be as follows on ***comparative contribution income statement***.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Without special order****1,000,000 units to be sold** | **With special order****1,100,000 units to be sold** | **Difference: relevant amount for the 100,000 units of special order** |
| Sales |  | Br. 20,000,000 |  | Br. 21,300,00 |  | Br. 1,300,000 |
| Variable Expenses: |  |  |  |  |  |  |
|  Manufacturing |  | Br. 12,000,000 |  | Br.13,200,000 |  | Br.1,200,000 |
|  Selling and Adm. |  |  1,100,000 |  |  1,100,000 |  |  |
| Total Variable Exp. |  | Br. 13,100,000 |  | Br. 14,300,000 |  |  1,200,000 |
| Contribution Margin |  | Br. 6,900,000 |  | Br. 7,000,000 |  | Br. 100,000 |
| Fixed Expenses: |  |  |  |  |  |  |
|  Manufacturing |  | Br. 3,000,000 |  | Br. 3,000,000 |  |  |
|  Selling and Adm. |  |  2,900,000 |  |  2,900,000 |  |  |
| Total Fixed Expenses |  | Br.5,900,000 |  | Br. 5,900,000 |  |  |
| Operating Income |  | Br.1,000,000 |  |  Br.1,100,000 |  | Br. 100,000 |

The above comparative income statements for Samson illustrates two key complete to analyzing relevant revenues for decision: (1) distinguish relevant costs and revenues from irrelevant ones and (2) use the contribution income statement to focus on whether each variable cost and each fixed cost is affected by the alternatives(i.e. reject or accept) under consideration.

In this case, the relevant revenues and costs are the expected future revenues and costs that differ as a result of accepting the special offer ---- sales of Br 1,300,000(Br 13 per unit X 100,000 units) and variable manufacturing costs of Br. 1,200,000 (Br 12 per units X 100,000 units). The fixed manufacturing costs and selling and Administration costs (including variable costs) are irrelevant. That is because these costs will not change in total whether the special order is accepted or rejected. Based on the relevant data analyzed above, Samson would gain an additional Br100, 000(relevant revenues, Br 1,300,000 less relevant costs Br 1,200,000) in operating income by accepting the special order. In this example, comparing total amounts for 1,000,000 units versus 1,100,000 units or focusing only on the relevant amounts in the difference column in comparative income statement avoids misleading implication --- the implication that would result from comparing the Br 13 per unit selling price against the manufacturing cost per unit of Br 15 (from Samson’s income statement on absorption costing basis) which includes both Variable and fixed manufacturing costs.

Thus, based on the relevant data analyzed above, Samson Company should accept the special order because it brings an additional income of Br. 100,000 for the company as:

|  |  |
| --- | --- |
| Income with special order | Br. 1,100,000 |
| Income without special order | 1,000,000 |
| Additional income if the order had been accepted | Br. 100,000 |

1. Yes. Unless Samson Company has effectively segments its market so that the special order to the Ethio Company does not affect the regular business.

**5.4.2. Product Line Decisions**

This is a decision relating to whether old product lines or other segments of a company should be dropped and new ones added are among the most difficult decision that a manager has to make. Operating results of multiproduct environments are often presented in a disaggregated format that shows results for separate product lines within the organization or division. In reviewing these disaggregated statements, managers must distinguish relevant from irrelevant information regarding individual product lines. If all costs (variable andfixed) are allocated to product lines, a product line or segment may be perceived to be operating at a loss when actually it is not. The commingling of relevant and irrelevant information on the statements may cause such perceptions.

 In classifying product line costs, managers should be aware that some costs may appear to be avoidable but are actually not. For example, the salary of a supervisor working directly with a product line appears to be an avoidable fixed cost if the product line is eliminated. However, if this individual has significant experience, the supervisor is often retained and transferred to other areas of the company even if product lines are cut. Determinations such as these needs to be made before costs can be appropriately classified in product line elimination decisions.

For instance, mostly on add or delete decisions, fixed costs are divided into two categories, avoidable and unavoidable. Avoidable costs are costs that will not continue if an ongoing operation is changed, deleted or eliminated. These costs are relevant costs in decision making. Unavoidable costs are costs that continue even if a subunit or an activity is eliminated and are not relevant for decision.

***Example.5.4*** Eyoha Department store has three major departments: groceries, general merchandise, and drugs. Management is considering dropping groceries, which have consistently shown a net loss, as shown below ***on statement of departments’ profitability***

***analysis of Eyoha.***

|  |
| --- |
|  **Departments** |
|  | **Groceries** | **General merchandise** | **Drugs** | **Total** |
| Sales | Br. 100,000 | Br. 8,0000 | Br. 10,000 | Br.190,000 |
| Variable CGS & Expenses  |   80,000 |   56000 |   6,000 |   142,000 |
| Contribution margin  | Br. 20,000 | Br. 24000 |  Br. 4,000 |  Br. 48,000 |
| Fixed expenses:             Avoidable           Unavoidable |  |  |  |  |
| Br. 15,000 | Br. 10,000 | Br. 1,500  |  Br. 26,500 |
|  6,000 |  10,000 |  2,000 |  18,000 |
| Total fixed expenses | Br.21,000 | Br. 20,000 | Br.3,500 | Br. 44,500 |
| Operating income (loss) | Br. (1,000) |  Br.4,000 | Br. 500 | Br. 3,500 |

***Required:***

* + 1. Which alternative would be recommended if the only alternatives to be considered are dropping or continuing the grocery department? Assume that the total assets would be unaffected by the decision and the space made available by dropping groceries would remain idle.
		2. Refer the income statement presented above. Assume that the space made available by dropping groceries could be used to expand the general merchandise department. The space would be occupied by merchandise that increase sales by Br. 50,000, generate a 30% contribution margin percentage and have additional avoidable fixed costs of Br.7, 000. Should Eyoha discontinue grocery and expand merchandise department?

|  |  |  |  |
| --- | --- | --- | --- |
|  | (A) TotalBefore change | (B) Effect ofdropping grocery | (A – B) Totalafter change |
| Sales | Br. 190.000 | Br 100.000 | Br 90.000 |
| Variable COGS and Expenses |  142.000 |  80.000 |  62.000 |
| Contribution margin | Br 48.000 | Br 20.000 | Br 28.000 |
| Fixed expenses |  |  |  |
| Avoidable | Br 26.500 | Br 15,000 | Br 11,500 |
| Unavoidable |  18.000 |  - |  18,000 |
| Total fixed expenses | Br 44,500 | Br 15,000 | Br 29,500 |
| Operating income (loss) | Br 3,500 | Br 5,000 | Br (1,500) |

***Solutions***

 (a). Analysis for dropping grocery department and leaving the space idle

In this analysis, column 2, presents the relevant –revenues and relevant-cost analysis using data from the grocery column in department profitability analysis of Eyoha. Eyoha’s operating income will be Br.5, 000 (income with grocery department, Br.3500 less loss assuming grocery is dropped, Br.1500 or it implies that the cost savings from dropping the grocery department, Br.95, 000 (Br.80, 000+ Br.15, 000), will not be enough to offset the loss of Br.100, 000 in revenues. So, under this condition Eyoha’s managers should decide to keep the grocery department rather dropping.

Notice that all of the grocery’s variable expenses are avoidable and relevant for decision making. If the grocery department is discontinued, the Br 6,000 of the fixed expenses will continue, which is irrelevant. And also note that there is no opportunity costs of using spaces for grocery because without grocery, the space and equipment will remain idle.

 (b) Analysis for dropping the grocery department and expanding general merchandise*.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (A) Totalbefore change | (B) Effect ofDropping Groceries | (C) Effect of ExpandingGeneral Merchandise | (A – B) + C Total after change |
| Sales | Br190,000 | Br 100,000 | Br 50,000 | Br 140,000 |
| Variable CGS and expense |  142,000 |  80,000 |  35,000 |  97,000 |
| Contribution margin | Br 48,000 | Br 20,000 | Br 15,000 | Br 43,000 |
| Fixed expenses |  |  |  |  |
| Avoidable  | Br 26,500 | Br 15,000 | Br 7,000 | Br 18,500 |
| Unavoidable |  18,000 |  - |  |  18,000 |
| Total fixed expenses | Br 44,500 | Br 15,000 | Br 7,000 | Br 36,500 |
| Operating income (loss) | Br 3,500 | Br 5,000 | Br 8,000 | Br 6,500 |

Effect of expanding general merchandise:

 Incremental revenue = Br 50,000

 Incremental cost

 Variable cost = (1-0.30) x 500,000 = (35,000)

 Fixed cost = (7,000)

Incremental income = Br 8,000

***Recommendation****:* As the above analysis shows, dropping grocery and using the vacated space to expand general merchandise will be a good decision.

***5.4.3. Optimal Use of Scarce Resources Decisions (Product Mix Decisions)***

Managers are frequently confronted with the short-run problem of making the best use of scarce resources that are essential to production activity, but are available only in limited quantity. ***Scarce resources*** create constraints on producing goods or providing services and can include machine hours, skilled labor hours, raw materials, and production capacity and other inputs. Management may, in the long run, obtain a greater quantity of a scarce resource. For instance, additional machines could be purchased to increase availability of machine hours. However, in the short run, management must make the most efficient use of the scarce resources it has currently.

Determining the best use of a scarce resource requires managerial recognition of company objectives. If the objective is to maximize company profits, a scarce resource is best used to produce and sell the product having the highest contribution margin ***per unit of the scarce resource.***This strategy assumes that the company is faced with only one scarce resource. A scarce resource or a limiting factor refers to any factor that restrict or constraint the production or sale of a product or service.

***Example5.*5** Jimma Computers manufactured two products, desktop computer and notebook computer. The Company’s scarce resource is a data chip that it purchases from a supplier. Each desktop computer requires one chip and each notebook computer requires three chips. Currently, the firm has access to only 5,100 chips per month to make either desktop or notebook computers or some combination of both. Demand is above 5,100 units per month for both products and there is no variable selling or administrative costs related to either product. The desktop’s Br. 650 selling price less its Br. 545 variable cost provides a contribution margin of Br. 105 per unit. The notebook’s contribution margin per unit is Br.180 (Br.900 selling price minus Br.720 variable cost). Fixed annual overhead related to these two product lines totals Br. 6,570,000 and is allocated to products for purposes of inventory valuation. Fixed overhead, however, does not change with production levels within the relevant range

***Instructions:*** on the bases of the above information which product is more profitable and on which products should the firm spend its resources?

***Solution:***

 Present information on two products being manufactured by Jimma Computers and total contribution margin per unit and per chip would be:

|  |  |  |
| --- | --- | --- |
| **Descriptions**  | **Desktop**  | **Notebook** |
| Selling price per unit (a)  | Br 650  | Br 900  |
| Variable production cost per unit: Direct material  Direct labor  Variable overhead  Total variable cost (b)  | Br.345     115  85 Br. 545  | Br. 480 125 115Br. 20 |
| Unit contribution margin [(c) = (a) \_ (b)]  | Br 105  | Br.180 |
| Chips required per unit (d)  |  1  |  3 |
| Contribution margin per chip of per unit [(c) /(d)] | Br.105 | Br.60 |

In the above analysis, because fixed overhead per unit is not relevant in the short run, unit contribution margin rather than unit gross margin is the appropriate measure of profitability of the two products. Unit contribution margin is divided by the input quantity of the scarce resource (in this case, data chips) to obtain the contribution margin per unit of scarce resource. The last line in the above analysis table shows the Br. 105 contribution margin per chip for the desktop compared to Br. 60 for the notebook. Thus, it is more profitable for Jimma Computers to produce desktop computers than notebooks.

At first glance, it would appear that the notebook would be, by a substantial margin, the more profitable of the two products because its contribution margin per unit (Br. 180) is significantly higher than that of the desktop (Br. 105). However, because the notebook requires three times as many chips as the desktop, a greater amount of contribution margin per chip is generated by the production of the desktops. If these were the only two products made by Jimma Computers and the company wanted to achieve the highest possible profit, it would dedicate all available data chips to the production of desktops. Such a strategy would provide a total contribution margin of Br. 535,500 per month (5,100 units \* Br. 105), if all units produced were sold.

In addition to considering the monetary effects related to scarce resource decisions, managers must remember that all factors cannot be readily quantified and the qualitative aspects of the situation must be evaluated in addition to the quantitative ones. For example, before choosing to produce only desktops, Jimma Computers’ managers would need to assess the potential damage to the firm’s reputation and markets if the company limited its product line to a single item. Such a choice severely restricts its customer base and is especially important if the currently manufactured products are competitively related

**5.4.4. Make or Buy (In source or out sourcing) decision**

 A concern with subcontracting or outsourcing has dominated business in recent years as the cost of providing goods and services in-house is increasingly compared to the cost of purchasing goods on the open market. Thus, a daily question faced by managers is whether the right components and services will be available at the right time to ensure that production can occur. Additionally, the inputs must be of the appropriate quality and obtainable at a reasonable price. Traditionally, companies ensured themselves of service and part availability and quality by controlling all functions internally. However, there is a growing trend toward “outsourcing” (buying) a greater percentage of required materials, components, and services.

 This ***outsourcing decision (make-or-buy decision***) is made only after an analysis that compares internal production and opportunity costs with purchase cost and assesses the best uses of available facilities. Consideration of an in source (make) option implies that the company has available capacity for that purpose or has considered the cost of obtaining the necessary capacity. The make versus buy decision should be based on which alternative is less costly on a relevant cost basis; that is, taking into account only future, incremental cash flows. In other words, in a make or buy situation with no limiting factors, the relevant costs for the decision are the differential costs between the two options.

 ***For example,*** the costs of in-house production of a computer processing service that averages 10,000 transactions per month are calculated as Br. 25,000 per month. This comprises Br.0.50 per transaction for stationery and Br. 2 per transaction for labor. In addition, there is a Br. 10,000 charge from head office as the share of the depreciation charge for equipment. An independent computer bureau has tendered a fixed price of Br. 20,000 per month.

Based on this information, stationery and labor costs are variable costs that are both avoidable if processing is outsourced. The depreciation charge is likely to be a fixed cost to the business irrespective of the outsourcing decision. It is therefore unavoidable. The fixed outsourcing cost will only be incurred if outsourcing takes place.

 The relevant costs for each alternative can be compared as shown in Table 6.1 below. The Br. 10,000 share of depreciation costs is not relevant as it is unavoidable. The relevant costs for this decision are therefore those shown in Table 6.2

Based on relevant costs, there would be a Br. 5,000 per month saving by outsourcing the computer processing service.

Table 5.1 Relevant costs – make versus buy

|  |
| --- |
|  **Cost to make Cost to buy** |
| Stationery 10,000 @ Br. 0.50 Br. 5,000Labour 10,000 @ Br. 2 20,000Share of depreciation costs 10,000 10,000Outsourcing cost 20,000Total relevant cost Br. 35,000 Br. 30,000 |

Table 5.2. Relevant costs – make versus buy, simplified

|  |
| --- |
|  Relevant cost to make Relevant cost to buyStationery 10,000 @ Br. 0.50 Br. 5,000Labour 10,000 @ Br. 2 20,000Outsourcing cost 20,000Total relevant cost Br. 25,000 Br. 20,000 |

 Note that relevant information for make or buydecision includes both quantitative and qualitative factors. Such as:

|  |
| --- |
| Quantitative Factors |
|  Buy |  Make |
| * the amount paid to supplier
 | * variable costs incurred to produce the component
 |
| * transportation costs
 | * special equipment to produce the product
 |
| * costs incurred to process the part upon receipt
 | * hire additional supervisory personnel to assist with making the product
 |
| Qualitative Factors |
| * Advantage of long term relationship with suppliers
 | * The quality of the product is decided to be controlled
 |
| * Possibility of shortage of material or labor for making the component
 | * If the purchase price is likely to rise due to increased demand in the market, it becomes uneconomical to buy
 |
| * Uninterrupted supply of requisite quality from reliable supplies
 | * Where the technical know-how is to be kept secret and not to be passed on to the suppliers
 |

***5.4.5. Keep or Replace Equipment Decisions***

The usefulness of plant assets may be impaired long before they are considered to be worn out. Equipment may be no longer being efficient for the purpose for which it is used. On the other hand, the equipment may not have reached the point of complete inadequacy. Decisions to replace usable plants assets should be based on studies of relevant costs. The relevant costs are the future costs of continuing to use the equipment versus replacement. The book values of the plant assets being replaced are sunk costs and are irrelevant.

As for example, assume that a business is considered disposing of several identical machines having a total book value of Birr 1,000,000 and an estimated remaining life of five years. The old machines can be sold for Birr 25,000. They can be replaced by a single high-speed machine at a cost of Birr 250,000. The new machine has an estimated useful life of five years and no residual value. Analyses indicate an estimated annual reduction in variable manufacturing costs from Birr 225,000, with the old machine to Birr 150,000 with the new machine. No other changes in the manufacturing costs or the operating expenses are expected. The relevant costs are summarized in the differential report are as follows:

***Proposal for Replacement Equipment (Differential Analysis Report – Replacement Equipment):***

Annual variable costs of present equipment (a) Birr 225,000

Annual variable costs - new equipment (b) 150,000

Annual differential decrease in cost(c= a-b) Birr 75,000

Number of years applicable (d) 5

Total differential decrease in cost (e=cxd) Birr 375,000

Proceed from sales of present equipment (f) 25,000                                 total (g =e+f)                                                                  Birr 4, 00,000

Cost of new equipment (h) 2, 50,000

Net differential decrease in cost, 5 year total (i =g+h ) Birr 1, 50,000

So, annual net differential decrease in cost – new equipment (i÷d) Birr 30,000

Additional factors are often involved in equipment replacement decisions. For example, differences between the remaining useful life of the old equipment and the estimated life of the new equipment could exist. In addition, the new equipment might improve the overall quality of the product, resulting in an increase in sales volume. Other factors that could be significant include the time value of money and other uses for the cash needed to purchase the new equipment.

In general, in deciding whether to replace or keep existing equipment, four commonly encountered items considered in relevance:

1. Book value of old equipment: irrelevant, because it is a past (historical) cost. Therefore, depreciation on old equipment irrelevant.
2. Disposal value of old equipment: relevant, because it is an expected future inflow that usually differs among alternatives.
3. Gain or loss on disposal: this is the algebraic difference between book value and disposal value. It is therefore, a meaningless combination of irrelevant and relevant items. Consequently, it is best to think of each separately.
4. Cost of new equipment: relevant, because it is an expected future outflow that will differ among alternatives. Therefore, depreciation on new equipment is relevant.