Unit - 4

Module - 7

Decision Making

- Introduction and Meaning
- Steps in Decision Making
- Managerial Decision Making Problems
- Models of Decision Making
- Concepts of Relevant Costs and Irrelevant Costs
- Different Costs for Decision Making
  - Sunk Costs
  - Opportunity Costs
  - Imputed Costs
  - Fixed Costs
  - Variable Costs
  - Out of Pocket Cost
  - Book Cost
  - Shut down Cost
  - Differential Cost
- Features of Differential Cost
- Difference between Marginal Costing and Differential Cost
- Types of Decision Making
- Practical Problems
Introduction and Meaning:

Decision Making involves the act of selecting one course of action from among various feasible alternatives available. Many quantitative and qualitative aspects have to be taken into account in decision-making. The manager chooses that course of action which he considers as the most effective for achieving goals and solving problems. Decision-making is an integral part of all management functions like planning, organization, coordination and control. All decisions are futuristic in nature, involving a forecast of what management thinks is likely to occur but it is very uncertain. The term 'cost' is has multiple nuances. It has different meanings in different situations. A cost accountant examines each situation in depth to decide the kind of cost concepts to be used and plays an important role in decision-making by making precise and relevant data available to the management.

There are chiefly two kinds of decisions involved in the decision making: long-term and short-term decisions. Short-term decisions, usually, are particular in nature. The specificity of information for the decision making relies on the given situation calling for a decision. Here, such information is called the 'relevant data'. The short term decisions are mostly affected within a year. Such short-run operating decisions may involve a host of special non-recurring decisions such as make or buy; sell or process; accept or reject an order and other decisions. The long -term decisions force the management to look beyond the current year. Time value of money and return on investment are major considerations in long term decisions. Uncertainty is an integral part of the decision-making. Hence, the task of decision-making is quite difficult, crucial and critical.

Managerial Decision Making is the act of making up your mind about something or a position or opinion or judgment that is arrived at after some consideration.
Managerial Decision Making is the process of selecting from several choices, products or ideas, and taking actions.

"Managerial Decision Making is the process by which managers’ responds to opportunities and threats by analyzing options and making decision about goals and courses of action."

- Warren Weber

**Steps in Decision-Making:**

It will be opportune here to discuss some major important steps which are helpful in logical decision making.

1. **Defining and Clarifying the Problem:** The first step is to define problem clearly and precisely for decision making so that quantitative data that are relevant to its solution can be determined. The possible alternative solutions to the problem should be identified. At times, consideration of more alternative solutions may make the matters more complex. After that, proper scanning device will help to remove unattractive alternatives.

2. **Collective and Analyzing Data:** In this regard, if the decision-taker feels necessary, he may ask for further information. In fact, a number of decisions improvised by acquiring further information and it is normally possible to obtain such information.

3. **Analyzing the Problem:** All alternatives have their own advantages and disadvantages. The decision taker has to take decisions on the basis of the problem intensity. Problem must be observed from different vantage points to determine the largest net advantage.

4. **Ascertainment of Alternative action:** The decision maker identifies an alternative course of action. The screens possibilities by computing various cost structure and revenues under each of the options.
5. **Evaluating each Alternative:** There are two types of aspects, viz. quantitative aspects and qualitative aspects. A decision maker observes all benefits and limitations of the various aspects to get a best option for enhancement of the company.

6. **Selection of an Alternative:** After defining, collecting, analyzing, checking various alternatives and evaluating them, the decision-maker can select the alternative and start work on it.

7. **Appraisal of the Result:** After executing the decisions, the decision maker should regularly seek an appraisal of the results. This will help him in correcting his mistake, modifying his target and making a better forecast in the times to come.

   In this regard, numbers of techniques are used for decision making which are as follows:
   
   a) Marginal Costing
   
   b) Break-even Analysis
   
   C) Differential Cost Analysis

**Managerial Decision Making Problems:**

Managerial decision making typically hinges on three types of problems, which are as follows:

1. **Crisis:** A crisis problem is a serious difficulty requiring immediate actions.

2. **Non-Crisis:** A non-crisis issues that requires resolution do not simultaneously have the importance and immediacy characteristics of a crisis.

3. **Opportunity Problems:** An opportunity problem is a situation that offers strong potential for significant organizational gain if appropriate actions are taken.
Models of decision making:

1. **Rational Model**: It is most popular type of model which is based on a cognitive judgment, and pros and cons of various options.

2. **Non-Rational Model**: This can be further classified in to the followings:
   - **A. Satisfying Model**:
   - **B. Incremental Model**:
   - **C. Garbage-can Model**:

Concepts of Relevant Costs and Irrelevant Costs:

1. **Relevant Costs**:

   It is the process of analyzing and selecting a course of action from a number of alternatives. In this analysis, basic emphasis remains on identification of relevant costs, revenues and resources that change in between alternative courses of action. The term 'relevant' means 'applicable to decision at hand'. Costs are relevant if they guide the manager towards the decision that synchronizes with top management’s objectives. It will be ideal if the costs are not only relevant or applicable but also accurate.

   Managerial Accounting essentially describes costs that are specific to the management’s decisions. The concept of relevant costs eliminates unnecessary data that could complicate the decision-making process.

   Relevant costs are decision specific in that they may be important in one situation but irrelevant in another. Some examples of the relevant costs in a business are selling or keeping a business unit, making or buying an item, or accepting a special order.

   Making correct decision is one important task of a successful manager. Every decision involves a choice between at least two alternatives. The decision
process may be complicated by volume of data, irrelevant data, incomplete information, an unlimited alternatives etc. The role of the managerial accountant in this process is often that of a gatherer and summarizer of relevant information rather than the ultimate decision maker.

The cost and benefits of alternatives need to be compared and contrasted before making a decision. The decision should be based only on 'Relevant Information'. Relevant information includes the predicted future cost and revenues that differ among the alternatives. Any cost or benefit that does not differ between alternatives is irrelevant and can be ignored in a decision. All future revenues and/or costs that do not differ between the alternatives are irrelevant. Sunk Costs (cost already irrevocably incurred) are always irrelevant since they will be the same for any alternative.

To identify which costs are relevant in a particular situation, consider the following three-step approach:

1. Eliminate sunk cost.
2. Eliminate cost and benefits that do not differ between alternatives.
3. Compare the remaining costs and benefits that differ between alternatives to make proper decision.

**Characteristics:**

1. Relevant Costs are future expected costs: The decision is to be implemented in future and so relevant costs are also to be incurred in future. Certainly, all future costs are not relevant costs but all relevant costs are future costs. This is because past costs are the result of past decisions and no current or future decision can change what has already happened.
2. It differs between different decision alternatives: It differs when more than two alternatives are considered. Those costs which will not change between different alternatives are to be ignored.

3. It may not be available in for books: All relevant costs are not available in have books, for only those expenses are mentioned in books which have already taken place, excluding the anticipated costs.

4. Relevant Costs are Cash Flows: Those alternatives only that enhance the value of cash resources in future should be accepted. That expense is irrelevant for decision-making in which no cash payment is involved.

5. Variable Costs may be Irrelevant: The variable costs are usually relevant costs. However, such costs may be irrelevant sometimes.

**Concept of Irrelevant Cost:**

The concept of irrelevant cost is one part of the process of decision making in managerial accounting. In the course of business the eventual developments occur that do not happen to affect the production process directly. However, these developments may or may not be denominated in monetary terms. Thus, such developments are called irrelevant cost.

**Characteristics:**

1. They do not differ between different decision alternatives.

2. They may be in money terms or not.
**Different Costs for Decision Making:**

In management accounting system, each product is usually charged with a portion of indirect costs, which are not traceable to the product. Hence, cost data drawn from the cost accounting system are often not relevant as they are historical costs. Therefore, such cost that alternatively keeps on oscillating may in future be qualified for the relevant cost.

(1) **Marginal Costing:** It includes only variable costs and it does not include fixed costs. At any particular level of output, a change in the total cost by increase or decrease of one unit is called marginal cost. Marginal costing is based on variable cost so that the management can take decisions on the basis of variable costs. Marginal costing is extremely useful for decision making. In fact, it is a major tool for decisions making.

(2) **Sunk Cost:** It refers to the money already spent and permanently lost. Sunk costs are past opportunity costs that are partially (salvaged, if at all). Therefore, it should be considered irrelevant to future decision making. Sunk costs are those costs which do not change under given circumstance and do not play any role in decision making process. They are historical costs that had incurred in the past. In other words, these are the costs which have been incurred by a decision made in the past and cannot be changed by any decision to be made in the future. This cost is also known as Committed Cost and Historical Cost.

(3) **Opportunity Cost:** The opportunity cost of the value of opportunity foregone is taken into consideration when alternatives are compared. Opportunity cost is the value of the next best alternative. In other words, it is the opportunity cost lost by diversion of input factor from one use to another. It is the measure of the benefit of opportunity foregone. Opportunity cost is a
pure decision-making cost. It is an imputed cost, which does not require cash payout.

The opportunity cost is helpful to managers in evaluating various alternatives available when multiple inputs can be employed for multiple uses. These inputs may nevertheless have a cost and this is measured by the sacrifice made by the alternative action in course of choosing another alternatives.

"The value of a benefit sacrificed in favour of an alternative course of action."

- C.I.M.A. London

(4) **Imputed (Notional) Cost:** This is similar cost to the opportunity cost in that they are not recorded in the accounting books. However, they are hypothetical costs that must be taken into consideration if a correct decision is to be arrived at. In auditing it requires special treatment. Imputed cost comes from what one could have made from an asset if you had used it differently. If one has money tied up in assets that are declining in value, or in accounts receivable, audit standards allow one to deduct an imputed cost for that money. In accounting, the expenses of unreimbursed goods and services are provided by one entity to another entity. It is an expense that is borne indirectly. For example, notional rent charged on business premises owned by the proprietor or interest on capital for which no interest has been paid.

(5) **Fixed Costs:** The cost which always remains fixed irrespective of production volume is known as fixed costs. This cost remains constant whether production activity is increased or decrease. It doesn’t mean that fixed costs are fixed for all time to come. It is subject to change over a period of time. The fixed cost per unit will become smaller with increase in volume because
fixed costs are unaffected by volume changes, any increase in volume implies that the cost will be allocated to a more number of units and vice versa. For short term managerial decision making, fixed cost may be relevant or irrelevant. When a particular decision is made that results in occurrence of fixed cost, it is relevant but if it occurs irrespective of any decision taken in a certain situation then it is irrelevant cost. From the viewpoint of Profit Planning and Control, it is useful to sub-divide fixed cost into two types i.e. 'Committed Fixed Costs' and 'Discretionary Fixed Costs'.

(6) **Variable Costs:** The cost which varies with the production volume is known as variable cost. It suggests that this cost varies with the increase or decrease in production. It is so because the input of raw material is used in the exact quantities needed for production process. From the viewpoint of their behavior, variable costs are also known as 'Engineered Cost'. Though it is believed that all variable costs are relevant, it is actually not so because if variable costs vary depending on different alternatives for decision making process.

(7) **Out of Pocket Cost:** Out-of-Pocket costs are those expenses which are current cash payments to the outsiders. All the explicit costs like payment of rent, wages, salaries, interest, transport charges etc. fall in category of out-of-pocket costs. This cost is useful while taking decision like make or buy and price fixation during depression. When availability of fund or cash resources is limited, this type of cost becomes decisive in decision making process.

(8) **Book Cost:** Book costs are those business costs that do not involve any cash payment. However, a provision is made for book costs where of they are considered under the profit and loss account. This exercise enables the company to gain tax benefits. Here, the provisions for book costs, for
example, could be depreciation, unpaid amount of the interest on the owners capital employed in the firm among others.

(9) **Replacement Cost**: It is a cost at which an asset or material was purchased that would replace the previous valuables. It is the cost of replacement at current market price.

(10) **Avoidable Cost and Unavoidable Cost**: These costs can be avoided in future as a result of managerial choices because the management can choose not to incur them. Particular avoidable costs are often compared with the decision alternatives. For instance, salary paid to employees in the section can be stopped if the section is terminated. Unavoidable cost is that cost which will not be eliminated with the discontinuation of a product or section. For instance, salary of company manager cannot be stopped even if a product is terminated.

(11) **Differential Cost**: Differential cost (which may be incremental cost or decremental cost) is the difference in the total cost that will arise from the selection of one alternative instead of another. It involves the estimation of the impact of decision alternatives on costs and revenues. The two basic concepts which go together with this type of cost analysis are 'incremental cost and incremental revenue and decremental costs and decremental revenue.' It is used generally as a synonym to relevant cost. If the change in the cost is in the increasing mode, it is called incremental cost; if it is decreasing with the decrease in output, it is decremental cost. Incremental revenue increases between two alternatives, while decremental revenue decreases between two alternatives.
Features of Differential Cost:

1. It differs from action to action.
2. It does not include all variable costs due to being a future cost and it is considered as differential depending upon the situation.
3. This data is related to costs, revenue and investment factors.
4. It considers only incremental cost or decremental costs and not the cost per unit.
5. At the time of selecting alternatives one should consider optimistic difference between cost and revenue.

Difference between Marginal Costing and Differential Costing:

<table>
<thead>
<tr>
<th>Marginal Costing</th>
<th>Differential Costing</th>
</tr>
</thead>
<tbody>
<tr>
<td>It represents the increase or decrease in total cost which occurs with a small change in output.</td>
<td>It is the change(increase or decrease) in the total cost due to the change in level of activity, technology, production process or methods of production</td>
</tr>
<tr>
<td>In this only variable cost changes due to a change in the level of activity.</td>
<td>Here, variable as well as fixed cost change due to a change in the level of activity.</td>
</tr>
<tr>
<td>Marginal costing wholly excludes fixed cost; some of the fixed cost may be taken into account as being relevant for the purpose of differential cost analysis.</td>
<td>Differential costing can be made in the case of both absorption costing as well as marginal costing.</td>
</tr>
<tr>
<td>Marginal costing may be embodied in the accounting system.</td>
<td>Differential costs are separately noted as analysis statements.</td>
</tr>
<tr>
<td>In Marginal Costing, margin of contribution and contribution ratios are the main yardsticks for the performance evaluation and for decision making.</td>
<td>In differential cost analysis, different costs are compared with the incremental or decremental revenues as the case may be.</td>
</tr>
</tbody>
</table>
Types of Decision Making:

The strategic managerial decisions are made on the following types with the use of differential cost analysis and marginal costing:

(1) **Make or Buy Decisions:** Sometimes firms have to choose from the available resources as to whether manufacture certain components themselves or acquire them from outside suppliers. For this, incremental analysis provides solution. Committed costs are very important input information. If the firm had adequate idle capacity to make the components, then the firm would not require incurring fixed costs for producing the components.

Make or Buy decisions will be taken with the help of marginal costing in the following manner

(i) in a situation where a firm, although capable of manufacturing, fails to actualize its production and fulfils its requirements from external sources, then the purchase plus fixed cost of manufacture to take decision to make or buy.

(ii) When the productive capability exists and it is utilized for manufacturing other products, the purchase price should be compared with the marginal cost of the product plus opportunity cost,

(iii) When there is no additional capacity in effect and it is proposed to acquire additional facilities for manufacturing, the purchase price should be compared with the marginal cost plus fixed cost likely to be incurred for manufacturing with additional facility.

Before taking a decision regarding make or buy one must consider,

a) The strength of the company as regards personal, plant, space and other amenities.

b) The differential cost of making them or buying them from the market,
c) The opportunity cost of existing capacity and
d) The variable overheads which are charged to any item.

(2) **Adding and Dropping Product Line and other Segments:** A segment should be added only if the increase in Total Contribution Margin is greater than the increase in fixed cost. A segment should be dropped only if the decrease in Total Contribution Margin is less than the decrease in fixed cost. Before deciding for adding or dropping product line or other segment, Allocated Common Costs should be taken into consideration. Some major points to be considered for discontinuation of product as follows:

a) Highly competitive nature of the product

b) Value of resources released on discontinuation

c) Contribution margin earned from that product

(3) **Purchasing or Leasing:** While taking decision regarding capital investment, company management will think on the two available alternatives, i.e. whether to purchase the required assets or to lease it from the outside. To take such decisions, company will compare the total cost of both the alternatives and will try to know the additional savings. If the additional savings occur after purchasing it, then it should be purchased and if the additional savings are from leasing it then it should be leased.

(4) **Shut-Down Costs:** It is a point of operation where a firm is indifferent to continuing operations and shutting down temporarily. The shutdown point is the combination of output and price where a firm earns just enough revenue to cover its total variable cost. Shutdown cost is that cost which the firm incurs when it temporarily stops its operations. These costs could be saved if the operations are allowed to continue. Beside fixed costs, shutdown costs include the cost of sheltering plant and equipment, lay-of-expenses,
employment and training of workers when the plant is restarted and above all loss of market. It occurs when a firm suspends its activities temporarily or permanently. Temporary shutdowns are usually due to a maintenance or strike, while permanent shutdowns are typically synonymous to going out of business. While calculating shutdown costs, one must only consider the cost that would not occur if the firm continues its operations.

The other important factors to be considered are:

a) In case of shutting down the business, other companies may get a chance to establish their product and business.

b) If the production is suspended, the product would be lost from public memory and when the business restarts, it would take a heavy expenditure on marketing.

c) Once the skilled workers are discharged it might be difficult to get experienced and skilled workers when the business resumes.

d) Machines and equipments become obsolete because new technological changes continuously happen.

e) Closing down business for limited period or specific activity may leave and adverse impact on the company or sully its reputation.

Non-collection of dues from debtors is one the major worries in case of the closure of business.

(5) Acceptance or Rejection of/ Foreign Orders or Exploring New Markets:
Acceptance or Rejection of special order frequently happens. The opportunity arises for the management to consider an order for a quantity of its regular product at a special price (usually less than that charged regular customers). When there is excess or idle production capacity, such a situation may be attractive. The firm usually gets inclined to accept special offer because of its idle status which makes its operating level below its full
capacity. But should it be accepted at the price quotation given by the buyer or at some negotiated price? Such a special order will not affect the regular sales of the same product. If there is no idle capacity, the question of accepting or rejecting an order does not arise. This decision is entirely based on differential cost and the contribution margin. The real analysis of cost and revenue employs the relevant cost approach. Irrelevant items should be excluded from the analysis. Fixed cost does not increase generally by accepting orders. In other words, fixed costs typically will not change in total irrespective of the acceptance or rejection of the order. But incremental fixed cost is a relevant cost. In case of variable costs, it increases by accepting order. If the price offered is more than the marginal cost, that proposal may be accepted. But when the price offered is less than the marginal cost, that offer is to be rejected. In such a decision, some qualitative factors are considered such as:

i. The impact on future earnings
ii. Effect on existing customers
iii. Selling additional units beyond the present order
iv. Capacity expansion etc.

In the process of decision making, the income statement is generated which clearly shows the marginal cost, fixed cost and profit. If the profit increases on acceptance of the order, that order should be accepted and if not then it should be rejected.

(6) **Sell or Process Further Decision:** In some manufacturing processes, several intermediate products are produced from a single input. Such products are known as joint products. The costs associated with making these products up to the point where they can be recognized as separate products (the split-off point) are called joint product costs.
Sooner or later a decision often has made about selling a joint product as it is or after processing it further. It is profitable to continue processing a joint product after the split-off point so long as the incremental revenue from such processing exceeds the incremental processing costs. In such decisions, the joint product costs incurred before the split-off point are irrelevant and should be ignored.

(7) **Special Orders:** Special orders are one-time orders that do not affect a company’s normal sales. The profit from a special order equals the incremental revenue less the incremental costs. As long as the incremental revenue exceeds the incremental cost and present sales are unaffected, the special order should be accepted.

(8) **Utilization of Constrained Resources:** Whenever the demand exceeds the productive capacity, a production constrain (bottleneck) comes into existence. This means that the company is unable to fill all orders and some choices have to be made as regards fulfillment or non-fulfillment of orders. Total contribution margin will be maximized by promoting those products or by accepting those orders that provide the highest unit contribution margin in relation to the constrained resources.

(9) **Technology Replacement:** A management often faces this decision when choice has to be made between retention of technology or its replacement. This decision is based on the consequent savings in the cost after installing a new machine which would result in the increased profitability. Replacement of technology is a capital investment or a long term decision requiring the use of discounted cash flow technique. This question arises when the outmoded technology has finished its useful life and that there is no alternative left but to replace it with the current technology. Here, some
additional fixed cost might incur. Some important aspects for this decision are:

a) Significant difference occurs in costs between both the technologies due to depreciation.

b) The decision will impact the outflow and inflow of cash for a specific technology.

c) The decision of selling the old technology must be considered for the analysis.

d) The company must identify as to which time is fit for the replacement of technology as would be help reduce the cost.

e) Decisions of increased production improve profitability. However, if the market does not accept the increased production, then installing a new technology becomes futile.

(10) Determining Optimum Product-Mix: If company manufactured more than one product, a problem occurs as to the product-mix or the sales-mix which will earn the maximum gain. The product-mix gives maximum contribution to the ideal product-mix. Therefore, in order to determine the best product-mix, the contribution of each product must be calculated. Moreover, the production must be prioritized in order so that it can give the maximum contribution per unit. The best product-mix would be that which increase P.V. Ratio or which reduces break-even point.