MODULE 4 MANAGERIAL DECISION MAKING AND CONTROLLING

Managerial Decision Making

Concept

Decision is in most simple terms defined as *a conclusion/resolution reached after a consideration. It is a commitment to oneself/society.*

Decision Making in simplest form, defined as *an action/process of making an important decision*

Psychologically defined, *Decision making is a conscious human process involving both individual and social phenomenon based upon factual and value premises which concludes with a choice of one behavioural activity from among one or more alternative with the intention of moving towards some desired state of affairs*

Decision making, thus, is a managerial act of projecting one's own mind upon an opinion or a course of action. In decision making, three aspects of human behaviour are involved:

1. Cognition – activities of mind associated with knowledge
2. Conation – the action of the mind implied by such words as willing, desire, and aversion;
3. Affectation – the aspect of mind associated with emotion, feelings, mode and temperament.

Types of decisions

There are different types of decisions. The following are the main types of decisions every organization need to take:

1. Programmed and non-programmed decisions

Programmed decisions are concerned with the problems of repetitive nature or routine type matters. A standard procedure is followed for tackling such problems. These decisions are taken generally by lower level managers. Decisions of this type may pertain to e.g. purchase of raw material, granting leave to an employee and supply of goods and implements to the employees, etc.

Non-programmed decisions relate to difficult situations for which there is no easy solution. These matters are very important for the organisation. For example, opening of a new branch of the organisation or a large number of employees absenting from the organisation or introducing new product in the market, etc., are the decisions which are normally taken at the higher level.

2. Routine and strategic decisions

Routine decisions are related to the general functioning of the organisation. They do not require much evaluation and analysis and can be taken quickly. Ample powers are delegated to lower ranks to take these decisions within the broad policy structure of the organisation.

Strategic decisions are important which affect objectives, organisational goals and other important policy matters. These decisions usually involve huge investments or funds. These are non-repetitive in nature and are taken after careful analysis and evaluation of many alternatives. These decisions are taken at the higher level of management.

3. Tactical (Policy) and operational decisions

Decisions pertaining to various policy matters of the organisation are policy decisions. These are taken by the top management and have long term impact on the functioning of the concern. For example, decisions regarding location of plant, volume of production and channels of distribution (Tactical) policies, etc. are policy decisions.

Operating decisions relate to day-to-day functioning or operations of business. Middle and lower level managers take these decisions. An example may be taken to distinguish these decisions. Decisions concerning payment of bonus to employees are a policy decision. On the other hand if bonus is to be given to the employees, calculation of bonus in respect of each employee is an operating decision.

4. Organisational and personal decisions

When an individual takes decision as an executive in the official capacity, it is known as organisational decision. If decision is taken by the executive in the personal capacity (thereby affecting his personal life), it is known as personal decision.

Sometimes these decisions may affect functioning of the organisation also. For example, if an executive leaves the organisation, it may affect the organisation. The authority of taking organizational decisions may be delegated, whereas personal decisions cannot be delegated.

5. Major and minor decisions

Another classification of decisions is major and minor. Decision pertaining to purchase of new factory premises is a major decision. Major decisions are taken by top management. Purchase of office stationery is a minor decision which can be taken by office superintendent.

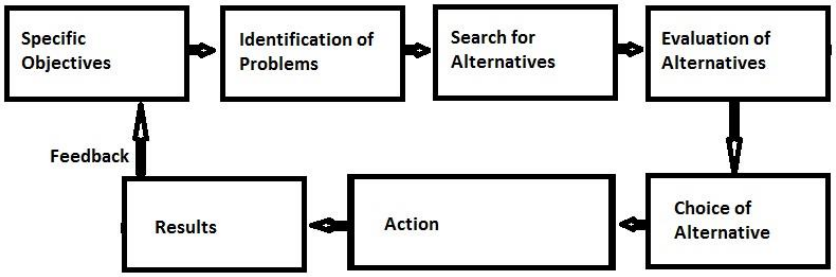
6. Individual and group decisions

When the decision is taken by a single individual, it is known as individual decision. Usually routine type decisions are taken by individuals within the broad policy framework of the organisation.

Group decisions are taken by group of individuals constituted in the form of a standing committee. Generally very important and pertinent matters for the organisation are referred to this committee. The main aim in taking group decisions is the involvement of maximum number of individuals in the process of decision-- making.

Decision-making process

When a manger makes a decision, it is in effect the organisation's responce to a problem . as such, decision should be thought of as means rather than ends. Every decision is the outcome of a dynamic process which is influenced by multiple forces.this process is presented in figure below



Specific Objective

The need for decision making arises in order to achieve specific objective. Every action of human being is goal directed. This is true for decision making also which is an action. Therefore, the starting pont in any analysis of decision making involves the determination of whether a decision needs to be made.

Problem Identification

Since, a particular decision is made in the context of certain given objectives; identification of problem is the real beginning of decision-making process. A problem is felt need, a question thrown forward for solution. It is the gap between present and desired state of affairs on the subject-matter of decision. A problem can be identified much clearly, if managers go through diagnosis and analysis of the problem.

1. Diagnosis

The term diagnosis has come from medical science where it is used as the process of identifying a disease from its signs and symptoms. A symptom is condition of set of conditions that indicates the existence of a problem. For example, a patient has certain symptoms on the basis of which his disease can be identified.

2. Analysis

While the diagnosis of problem gives the understanding of what should be done in terms of decision making, analysis of problem takes it a step further. The analysis of the problem requires to find out

who would make decision, what information would be needed, and from where the information is available.

Searching for Alternatives

A problem can be solved in several ways; however, all the ways cannot be usually satisfying. Further, if there is only one way of solving a problem, no question for decision arises. Therefore, the decision maker must try to find out the various alternatives available in order to the most satisfactory result of a decision. A decision maker can use several sources for identifying alternatives: his own best experience, practices followed by others, and using creative techniques.

Evaluation of alternatives

Under the various alternatives are identified, the next step is to evaluate them and select the one that will meet the choice criteria. However, all alternatives available for decision will not be taken for detailed evaluation because of the obvious limitations of managers in evaluating all alternatives.

Choice of Alternative

The evaluation of various alternatives presents a clear picture as to how each once them contributes to the objectives under question. A comparison is made among the likely outcomes of various alternatives and the best one is chosen. Choice aspect of decision making is related to deciding the most acceptable alternative which fit with the organisational objectives. There are 3 approaches for this: Experience, Experimentation & Research and analysis.

Action

Once the alternative is selected, it is put into action. Truly speaking, the actual process of decision making ends with the choice if alternative through which the objectives can be achieved. However, decision making, being a continuous & on-going process, must ensure that the objectives have been achieved by the chosen alternatives .

Result

When the decision is put into action, it brings certain results. These results must correspond with the objectives, the starting point of decision process. Thus, results provide indication whether decision making and its implementation was proper. Therefore, managers should take up a follow-up action in the light of feedback received from the results.

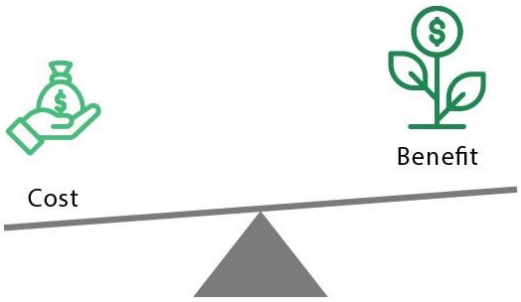
Decision-Making Tools & Techniques

Business Managers make hundreds of decisions every day, which influence the success of the business as a whole. There are many different decision-making techniques that are used by managers to help them choose among the alternatives and make a decision. In some instances, it may be a combination of a couple of different decision making strategies that help them achieve the best results. These tools are highly situational in nature. What works for some organizations may not work for others, and what works for making one decision may not work for the next. Let us list out FOUR of the more popular tools and strategies for decision-making.

1. Marginal Analysis: Marginal analysis weighs the benefits of an input or activity against the costs. This type of analysis helps business leaders determine whether and activity or input is providing the maximum return-on-investment (ROI). Marginal analysis is an effective tool for decision-making because it takes preferences, resources, and informational constraints into account, so managers can make more optimal decisions based on this information.

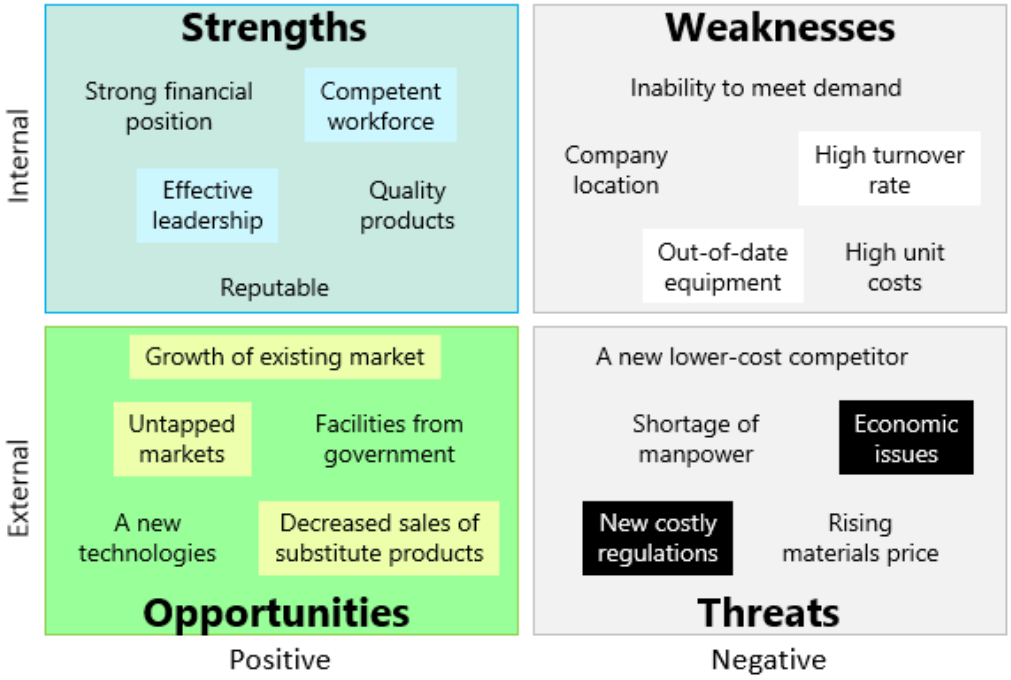
To conduct techniques like Marginal Analysis and Cost Benefit Analysis, you need to change a variable, such as the quantity of an input you use, or the volume of output you produce. Once you've identified that variable, determine what the increase in total benefits would be if one more unit of the control

variable were added. This is considered the marginal benefit of the added unit. Likewise, the marginal cost of the added good should also be calculated. The marginal cost is the increase in total cost if one more unit of the control variable were added. If the marginal benefit outweighs the marginal cost, then there is a "net benefit" and the marginal unit of the variable should be added.



2. SWOT Diagram: to make a significant change in your business, SWOT diagrams can help to break down the situation into four distinct quadrants:

- Strengths: What does your company do better than its competitors? Think of both internal and external strengths that you possess.
- Weaknesses: Where can your company improve? Try to take a neutral approach and consider what factors may be hurting your business.
- Opportunities: Look at your strengths and think of how you can leverage them to create new openings for your business. Also consider how eliminating a specific weakness could open you up to a new opportunity.
- Threats: Determine what challenges stand in the way of achieving your goals. Identify the primary threats to your organization.



A SWOT Analysis can help identify the forces that influence a strategy, action, or initiative. This information can then be used to guide in the right direction and support your business decisions. To get the full picture, it's essential to take multiple viewpoints into account. Taking a collaborative approach can also offer deeper insight into potential opportunities and threats you may not have been able to identify alone.

3. Decision Matrix: When dealing with multiple choices and variables, a decision matrix can bring clarity to the disarray. A decision matrix is similar to a pros/cons list, but it allows to place a level of importance on each factor. By this, a manager can accurately weigh the different options against each other.

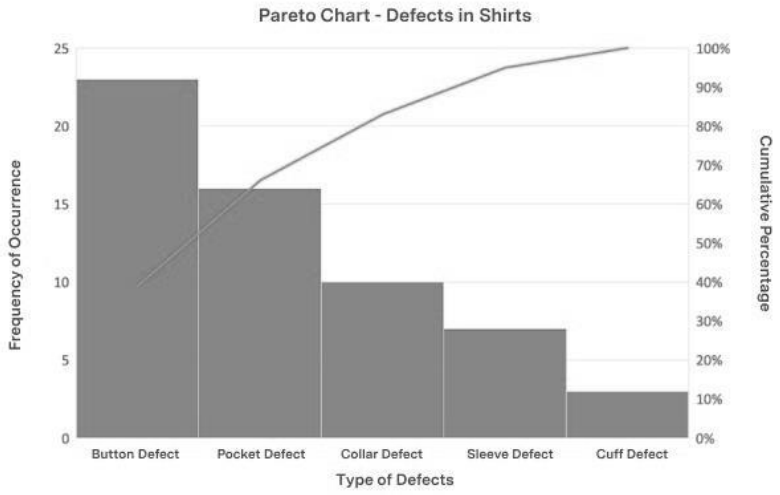
Steps to Create a Decision Matrix:

- List your decision alternatives as rows
- List relevant factors as columns
- Establish a consistent scale to assess the value of each combination of alternatives and factors
- Determine how important each factor is towards making your final decision and assign weights accordingly
- Multiply your original ratings by the weighted rankings
- Add up the factors under each decision alternative
- The option that scores the highest wins

For Example, A company is trying to make a decision about which vendor they should work with for an upcoming project. The factors they are using to evaluate each option are: capabilities, reputation, reliability, and price. They care more about the capabilities and price than the reputation and reliability of the vendor, so they weighted the importance of those factors accordingly. Based on the results from their decision matrix, they should be able to confidently decide on Vendor 2.

	Capabilities	**Reputation**	**Reliability**	**Price**	*Totals*
Importance	2	1	1	2	
Vendor 1	8	3	3	7	36
Vendor 2	9	7	7	3	38
Vendor 3	2	6	9	8	35

4.Pareto Analysis: The Pareto Principle helps in identifying changes that will be the most effective for the business. The principle is named after learned Economist Vilfredo Pareto, who found that an 80/20 distribution occurs regularly in the world. It states, 20% of factors frequently contribute to 80% of the organization's growth.



Applying this principle to business management, for example 80% of sales coming from 20% of its customers. A business can leverage the Pareto Principle by identifying the characteristics of the top 20% of their customers and finding more customers like them. When you can identify what small changes will make the largest impact, you are able to prioritize the decisions that have the highest level of influence. This allows Business Managers to dedicate their energy and resources on what will actually move the needle for their business.

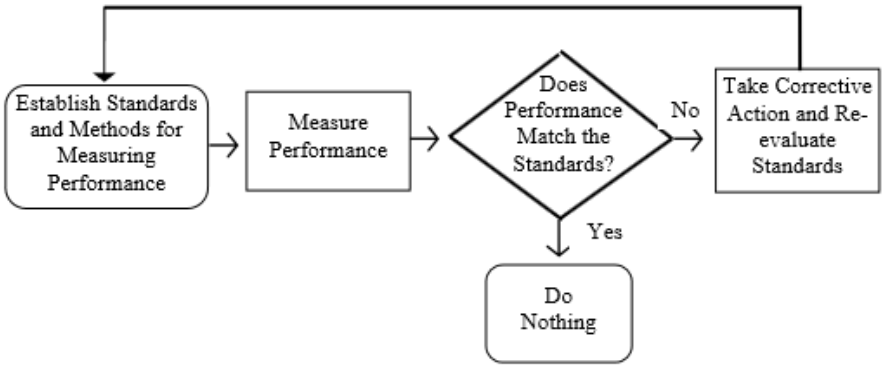
Importance of Controlling

Controlling is an important function of management which is needed in all the functions of management. Controlling checks mistakes and tells us how new challenges can be met or faced. The success of the organization thus hinges on the effective controlling.
Controlling is the function of the management process which is performed after planning, organizing, staffing and directing. Management control means the process to be adopted in order to complete the function of controlling. Controlling has the following steps

- Setting performance standards
- Measurement of actual performance
- Comparison of actual performance with standards
- Analysis deviations
- Taking corrective action

Basic Control Process: In practice, controlling determines what is being accomplished - that is, evaluating the performance and, if necessary, taking corrective measures so that the performance takes place according to plans. Controlling can also be viewed as detecting and correcting significant variations in the results obtained from planned activities.

Steps in the Control Process: The basic control process involves the following steps:



- *Establishing standards and methods for measuring performance:* Standards are, by definition, simply the criteria of performance. They are the selected points in an entire planning programme at which performance is measured so that managers can receive signals about how things are going and thus do not have to watch every step in the execution of plans.
- *Measuring the performance:* The measurement of performance against standards should be done on a forward-looking basis so that deviations may be detected in advance of their occurrence and avoided by appropriate actions
- *Determining whether performance matches the standard:* It is an easy but important step in the control process. It involves comparing measured results with the standards already set. If performance matches the standard, managers may assume that "everything is under control". In such a case the managers do not have to intervene in the organisation's operations.
- *Taking corrective action:* This step becomes essential if performance falls short of standards and the analysis indicates that corrective action is required. The corrective action could involve a change in one or more activities of the organisation's operations.

Techniques of Controlling

- Personal Observation: Personal observation of actual performance of the subordinates at the work place is the most effective, direct and oldest method of control. The managers need to hold discussion with the persons whose work is being controlled and they should watch the actual operations. Personal observation has also a psychological impact on the employees. Employees try to achieve better performance when they know that they will be observed personally by their superior. Thus, the managers can maintain work discipline among the employees.

- Ratio Analysis: 'Ratio Analysis' is a study of ratios between various items or groups in the financial statement of an organization. With the help of such analysis, the efficiency of financial performance of an enterprise can be judged. It measures financial condition, profitability and efficiency of the enterprise. Some important examples of Ratio Analysis are the analysis of Liquidity Ratio, Leverage Ratio, Turnover Ratio, Profitability Ratio, Valuation Ratio, etc.

- Cost Control: is an important technique for financial controlling process. The technique of cost control involves the determination of the standard in respect of each item of cost, ascertainment of the actual costs regarding those items, detection of variations in order to

determine the responsibility, cause, extent and cost of each variance, and then taking necessary action to ensure that the actual costs conform to the standard costs in future.

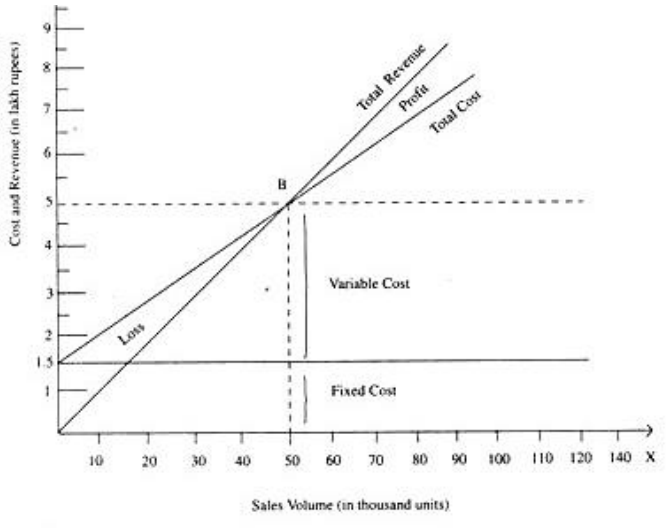
- Internal Audit: is an effective technique of financial and managerial control. It means the independent process of verifying and evaluating the accounting, financial and other functions of the business organisation. Internal Audit is carried out by the managers themselves or by the special staff appointed for this purpose. Compared to "External Audit' that remains unconcerned with the operational aspect of the organisation, internal audit is much broader in scope and concerned with the whole range of activities of the organisation.

- Network Techniques: a project or programme is broken down into small activities which are arranged in a techno-logical sequence. Various activities should be accomplished according to the sequence. The time limit for each activity is determined. A network diagram is then drawn in order to present the inter-dependence and inter-relationships among all the operations involved in the project.
  There are two popular network techniques:
  - Programme Evaluation and Review Technique (PERT)
  - Critical Path Method (CPM)

- Statistical Reports: The analysis of 'Statistical Reports' is a very important tool of control. Often quantitative control is exercised on the basis of analysis of the statistical reports prepared by different managers or higher authorities of an organisation. In such reports, they provide various information in respect of the accomplishment of work productivity, effectiveness and efficiency of the subordinates, deviations of performance from the standards, and the possible reasons for the deviations of the work or responsibilities allocated to different employees of the enterprise.

Break-Even Analysis

Break-even Analysis: is an important technique of cost control. It is an analysis of the inter-relationships among the cost of production, volume of production and the amount of profits. It is also known as 'Cost-Volume Profit Analysis'. Costs are of two types—fixed and variable. The relationships are shown on a chart called 'Break-even Chart' as given in Figure below.



In the chart, the X-axis represents the sales volume in thousand units, while the Y-axis represents the cost of production and sales revenue in lakh rupees. The fixed cost line is horizontal to the X-axis and the total cost line is drawn vertically from the intersection of fixed cost line at the Y-axis.
The revenue line has been drawn through the zero point on the Y-axis. The point 'B' at which the total revenue line intersects the total cost line is known as 'Break-even Point'(BEP). At this point there is no profit and no loss. The spread to the right of this point represents profit and the spread to the left represents loss. The volume of sales is 50,000 units at which the total cost and total revenue (Rs. 5 lakhs) are equal.

BEP = Fixed Costs/ Sale Price per unit – Variable Cost per unit

The advantages of Break-even Analysis are mentioned below:

- Break-even chart depicts graphically the total cost and sales revenue at various levels of sale. It helps in determining the minimum volume of sales at which costs are fully recovered and beyond which profit can be earned. It is an useful tool of managerial control.
- Break-even analysis can be applied to estimate profits at different levels of activity or to estimate the turn-over for desired profits.
- Through separating fixed costs and variable costs it enables the managers to exercise control over variable expenses.
- Break-even analysis is useful to the managers for decision-making and the preparation of budgets.

The disadvantages of Break-even Analysis are mentioned below:

- The classification of costs and their relationship which are assumed in this tool is not always possible.
- In this analysis, it is assumed that factor prices, technology and all other things are constant. But this is not always true. Actually, they are dynamic.
- Fixed costs remain fixed only up to a certain level of activity, and after this level, they rise considerably.

Budgetary Control

"Budgetary control is a system of controlling costs which includes the preparation of budgets, coordinating the departments and establishing responsibilities, comparing actual performance with the budgeted and acting upon results to achieve maximum profitability."

First of all, budgets are prepared and then actual results are recorded.
The comparison of budgeted and actual figures will enable the management to find out discrepancies and take remedial measures at a proper time. The budgetary control is a continuous process which helps in planning and co-ordination. It provides a method of control too. A budget is a means and budgetary control is the end-result.

The main objectives of budgetary control are the follows:

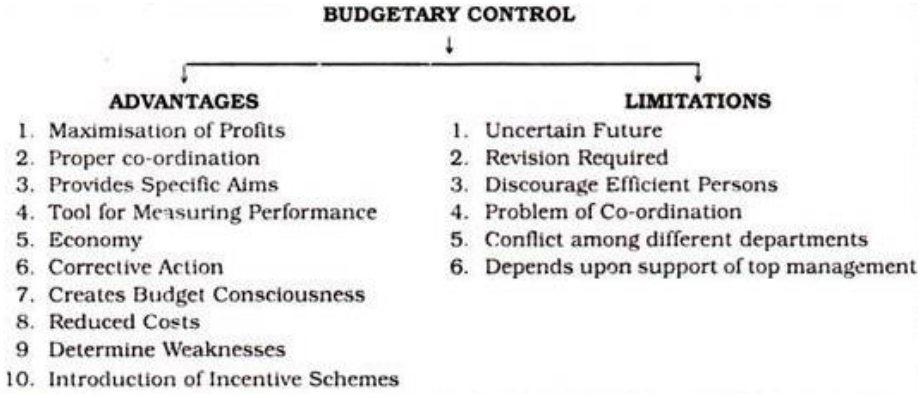
- To ensure planning for future by setting up various budgets, the requirements and expected performance of the enterprise are anticipated.
- To operate various cost centres and departments with efficiency and economy.
- Elimination of wastes and increase in profitability.
- To anticipate capital expenditure for future.
- To centralise the control system.
- Correction of deviations from the established standards.

- Fixation of responsibility of various individuals in the organization.

There are certain steps which are necessary for the successful implementation budgetary control system, listed as follows:

- Organisation for Budgetary Control : A Budgetary Committee is formed, comprising the departmental heads of various departments. All the functional heads are entrusted with the responsibility of ensuring proper implementation of their respective departmental budgets.
- Budget Centres : A budget centre is that part of the organization for which the budget is prepared. The establishment of budget centres is essential for covering all parts of the organization and also necessary for cost control purposes.
- Budget Mannual : is a document which spells out the duties and also the responsibilities of various executives concerned with the budgets. It specifies the relations amongst various functionaries. of budget centres is essential.
- Budget Officer : The budget officer is empowered to scrutinize the budgets prepared. The actual performance of different departments is communicated to the Budget Officer. He determines the deviations in the budgets and the actual performance and takes necessary steps to rectify the deficiencies, if any.
- Budget Committee: In small organizations the accountant is made responsible for preparation and implementation of budgets. In large-scale concerns a committee known as Budget Committee is formed. The heads of all the important departments are made members of this committee and is responsible for preparation and execution of budgets.
- Budget Period : is the length of time for which a budget is prepared and employed. It may be different for different industries or business.
- Determination of Key Factor: A proper co-ordination among different budgets is necessary for making the budgetary control a success. A factor which influences all other budgets is known as Key Factor or Principal Factor. The key factor may not necessarily remain the same, and may change over time. Raw materials supply, Sales etc are examples. Key Factor Determination will enable the management to improve the working of those departments where scope for improvement exists.

The Pros-Cons of budgetary control is summarized in following figure



A budget is a highly useful tool for controlling the day- to-day operations of the enterprise. It provides a standard by which actual performance can be evaluated to find out the deviations from the planned results. This information enables the managers to take corrective action for bringing the actual results in conformity with the plans. Budgetary control is an effective and widely used control technique.

Benchmarking

Benchmarking is comparing one's business processes and performance metrics to industry bests and best practices from other companies.
Dimensions typically measured are quality, time and cost. In the process of best practice benchmarking, management identifies the best firms in their industry, or in another industry where similar processes exist, and compares the results and processes of those studied (the "targets") to one's own results and processes. In this way, they learn how well the targets perform and, more importantly, the business processes that explain why these firms are successful.
Benchmarking may be a one-off event, but is often treated as a continuous process in which organizations continually seek to improve their practices.

Procedure

There is no single benchmarking process that has been universally adopted. The wide appeal and acceptance of benchmarking has led to the emergence of different benchmarking methodologies. Robert Camp, who wrote one of the earliest books on benchmarking (in 1989) proposes a 12-stage approach to benchmarking, as quoted below..

1. Select subject
2. Define the process
3. Identify potential partners
4. Identify data sources
5. Collect data and select partners
6. Determine the gap
7. Establish process differences
8. Target future performance
9. Communicate
10. Adjust goal
11. Implement
12. Review and recalibrate

Costs

The three main types of costs in benchmarking are:

- *Visit Costs* - This includes hotel rooms, travel costs, meals, a token gift, and lost labor time.
- *Time Costs* - Members of the benchmarking team will be investing time in researching problems, finding exceptional companies to study, visits, and implementation. This will take them away from their regular tasks for part of each day so additional staff might be required.
- *Benchmarking Database Costs* - Organizations that institutionalize benchmarking into their daily procedures find it is useful to create and maintain a database of best practices and the companies associated with each best practice now.

Types

Benchmarking can be internal (comparing performance between different groups or teams within an organization) or external (comparing performance with companies in a specific industry or across industries). Within these broader categories, there are three specific types of benchmarking:

1) Process benchmarking,
2) Performance benchmarking and
3) Strategic benchmarking.

These can be further detailed as follows:

- Process benchmarking - the initiating firm focuses its observation and investigation of business processes with a goal of identifying and observing the best practices from one or more benchmark firms.
- Financial benchmarking - performing a financial analysis and comparing the results in an effort to assess your overall competitiveness and productivity.
- Benchmarking from an investor perspective- benchmarking with peer companies that can be considered for alternative investment opportunities from the perspective of an investor.
- Benchmarking in the public sector - to improve public administration, organizations invest efforts and resources to achieve quality and effectiveness of the services they provide.
- Performance benchmarking - allows the initiator firm to assess their competitive position by comparing products and services with those of target firms.
- Product benchmarking - the process of designing new products or upgrades to current ones. which involve reverse engineering of competitor's products to find strengths and weaknesses.
- Strategic benchmarking - involves observing how others compete. This type is usually not industry specific, it also look into best strategies at other industries.
- Functional benchmarking - a company will focus its benchmarking on a single function to improve the operation of that particular function.
- Best-in-class benchmarking - involves studying the leading competitor or the company that best carries out a specific function/process/product.
- Operational benchmarking embraces everything from staffing and productivity to office flow and analysis of procedures performed.

Importance of Benchmarking

Benchmarking has various features that contribute a lot overall to the organization in terms of growth, development of new divisions, new technology adaptations and many more, and is important for following reasons.

- Good impact on customer's needs: By using various benchmarking methods, the organization gains good customer feedback. It helps to improvise the needs of the customer, meet the quality level expectancy and better delivery speed.

- Helps in raising company standards: Benchmarking contributes to raising the company standards by comparing it with various performers in the market. For example, by the process of benchmarking the organization might be able to raise the overall standard of the equipment used in production, etc.

- Betterment in learning methodologies: Benchmarking works towards the improvement in various learning methodologies adopted by the organization. It helps the organization to learn new methods, adopt new ideas, and new work model, etc.

- Get inspirations from the pioneers: Benchmarking gives inspiration from various pioneers of the market. Various inspirational stories of the leaders in the market encourages the employees to do bigger innovations in their own processes

- Strengthening the weakness: When something is not appropriate or up to the mark, benchmarking helps the organization to recover from the mistake that happened by throwing some light on the areas which have to be altered, and new ideas to improve the losses occurred.

- Enhances the learning experience: Benchmarking gathers information about the educational standards of the other organizations and new learning techniques followed, ultimately motivating the employees of organization to get a better knowledge base.

- Keeps in pace with new technology: Benchmarking helps the organization to adopt new technologies which is prevailing in the market and which is successfully adopted by many organizations.

- Works for employees career growth: Benchmarking not only does welfare for the organizational growth but also encourages employees career growth by supporting and encouraging them in bringing better outputs, and also helping them in eradicating the mistakes committed by them in their previous product developments.

Limitations of Benchmarking

Beyond all advantages of benchmarking there are few limitations also which have to be considered, like,

- It is just a mere suggestion: Benchmarking only suggests the organization to improve on weak factors. It does not have any proving factor to adopt the strategy it recommends.

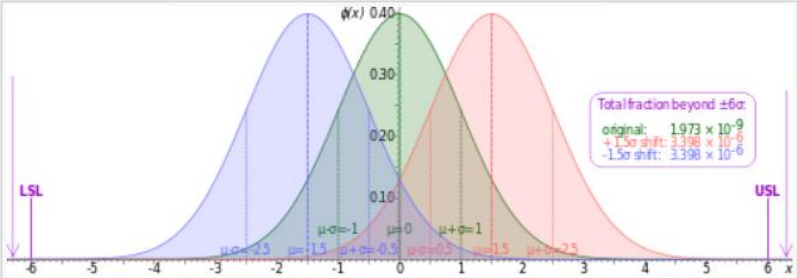
- Results shown are mere numbers: The result comparisons or profit rate of the other organization are mere numbers. Benchmarking does not concentrate on minute factors that have been adopted by the other organizations.

- Fails when it is not properly implemented: It has to be properly adopted by following the various data collected. When it is not followed periodically, there might be no net result as it is not a one day process.

- No clarity in data produced: Benchmarking only produces rough data and it is only the team or board members who have to concentrate on the whole process using the data collected. Sometimes managers do not even understand the data collected, as it moves from various people and it is left unnoticed when not properly used.

Six Sigma

Six Sigma is a method that provides organizations tools to improve the capability of their business processes. This increase in performance and decrease in process variation lead to defect reduction and improvement in profits, employee morale, and quality of products or services.
Six Sigma quality is a term generally used to indicate a process is well controlled (within process limits ±3s from the center line in a control chart, and requirements/tolerance limits ±6s from the center line).



Graph of the normal distribution, which underlies the statistical assumptions of the Six Sigma model. The Greek letter σ (sigma) marks the distance on the horizontal axis between the mean, μ, and the curve's inflection point. The greater this distance, the greater is the spread of values encountered.

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Six Sigma is a set of techniques and tools for process improvement. It was introduced by Er. Bill Smith while working at Motorola in 1986. Jack Welch made it central to his business strategy at General Electric in 1995. Today, it is used in many industrial sectors.

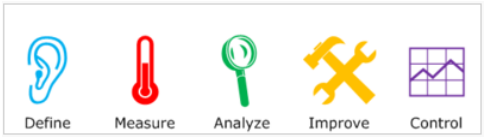
Six Sigma seeks to improve the quality of the output of a process by identifying and removing the causes of defects and minimizing variability in manufacturing and business processes. It uses a set of quality management methods & statistical methods and creates a special infrastructure of people within the organization, who are experts in these methods.

Methodologies

Six Sigma projects follow two project methodologies inspired by Deming's Plan-Do-Check-Act Cycle. These methodologies, composed of five phases each, bear the acronyms DMAIC and DMADV.

- DMAIC ("duh-may-ick") is used for projects aimed at improving an existing business process.
- DMADV ("duh-mad-vee") is used for projects aimed at creating new product or process designs.

DMAIC



The DMAIC project methodology has five phases:

- **D**efine the system, the voice of the customer and their requirements, and the project goals, specifically.
- **M**easure key aspects of the current process and collect relevant data; calculate the 'as-is' Process Capability.
- **A**nalyze the data to investigate and verify cause-and-effect relationships. Determine what the relationships are, and attempt to ensure that all factors have been considered. Seek out root cause of the defect under investigation.
- **I**mprove or optimize the current process based upon data analysis and create a new, future state process. Set up pilot runs to establish process capability.
- **C**ontrol the future state process to ensure that any deviations from the target are corrected before they result in defects. Implement control systems and continuously monitor the process. This process is repeated until the desired quality level is obtained.

Some organizations add a **R**ecognize step at the beginning, which is to recognize the right problem to work on, thus yielding an RDMAIC methodology.

DMADV or **DFSS**
The DMADV project methodology, also known as DFSS ("Design For Six Sigma"), features five phases:

- **D**efine design goals that are consistent with customer demands and the enterprise strategy.
- **M**easure and identify CTQs (characteristics that are Critical To Quality), measure product capabilities, production process capability, and measure risks.
- **A**nalyze to develop and design alternatives
- **D**esign an improved alternative, best suited per analysis in the previous step
- **V**erify the design, set up pilot runs, implement the production process and hand it over to the process owner(s).

Implementation Roles
Six Sigma involves the absolute "professionalizing" of quality management functions. Prior to Six Sigma, quality management in practice was largely relegated to the production floor and to statisticians in a separate quality department.
Formal Six Sigma programs adopt a kind of elite ranking terminology (similar to some martial arts systems, like Kung-Fu and Judo) to define a hierarchy that includes all business functions and levels.

Six Sigma identifies several key roles for its successful implementation.

- ***Executive Leadership*** includes the CEO and other members of top management. They are responsible for setting up a vision for Six Sigma implementation. They also empower the other role holders with the freedom and resources to explore new ideas.
- ***Champions*** take responsibility for Six Sigma implementation across the organization in an integrated manner. The Executive Leadership draws them from upper management. Champions also act as mentors to Black Belts.
- ***Master Black Belts***, identified by Champions, act as in-house coaches on Six Sigma. They devote 100% of their time to Six Sigma, ensuring consistent application of practices across various functions and departments.
- ***Black Belts*** operate under Master Black Belts to apply Six Sigma methodology to specific projects. Their primarily focus is on Six Sigma project execution and special leadership with special tasks.
- ***Green Belts*** are the employees who take up Six Sigma implementation along with their other job responsibilities, operating under the guidance of Black Belts.

Special training is needed for all of these practitioners to ensure that they follow the methodology and use the data-driven approach correctly. This training is very important.

Some organizations use additional belt colors, such as ***Yellow Belts***, for employees that have basic training in tools and generally participate in projects and ***White belts*** for those locally trained in the concepts but do not participate in the project team. ***Orange belts*** are also mentioned to be used for special cases.

Importance of Six Sigma

- Encourages Process Mapping
- Helps to Eliminate Waste and Variation

- Helps Project Management, in Scope, Time, Cost, Quality factors
- Phasedown on Defect Rates
- Create an Environment of Continuous Improvement

Limitations of Six Sigma

- Lack of originality
- Inadequate for complex manufacturing
- Role of consultants
- Over-reliance on statistical tools
- Suppresses creativity in research environments
- Lack of systematic documentation

Total Quality Management

A total approach to quality is the current thinking of today; which is popularly called total quality management (TQM). The idea behind TQM is to create a quality culture throughout the organisation. The concept of TQM was initiated by W.Edward Deming of Japan; over four decades ago. Gradually, the concept of TQM caught the attention of industrialists, all over the world.

Concept and Definition of TQM

TQM could be defined as a philosophy that believes in a company-wide responsibility toward quality via fostering a quality culture throughout the organisation; involving continuous improvement in the quality of work of all employees with a view to best meeting the requirements of customers.

Elements of TQM

The following are the basic elements of TQM:

- *Meeting Customers' Requirements:* Customer satisfaction is the key to the survival and growth of an organisation. TQM aims at best satisfying the requirements of customers which never remain constant; but keep changing with changes in environment and needs, preferences etc. of customers.
- *Continuous Improvement:* TQM is a total concept. It involves the integration of all functions and processes within an organisation, in order to achieve continuous improvement in the quality of products/services. Moreover, quality is a dynamic concept.With advancement in technology, an organisation must adopt new processes and redesign products to yield continuous improvement in quality to give the best advantage of technology to customers.
- *Involvement of all Employees:* TQM is called people's success. According to TQM philosophy, quality is not the responsibility only of production personnel. Rather it is a company-wide responsibility. TQM can be successful only when the total organisation is quality-conscious. TQM calls for improvement in the quality of work of all employees through popularizing the concept of quality culture. In fact, TQM should be the concern of all managers and workers, in the organisation.

Deming's Recommendations for Successful TQM:

W. Edward Deming makes fourteen recommendations to management for successful TQM.
For sake of simplicity and quick comprehension, these fourteen recommendations are classified into following four categories:

(I) General Recommendations:

(i) Create constancy of purpose for improvement of product/service; and aim of continuous improvement should be reflected in all aspects of organisational strategy.

(ii) Put everyone in the company to work on the transformation. Have patience to accomplish the transformation.

(iii) Adopt the new technology

(iv) Improve constantly and forever the system of production, quality and service. Continuous improvement is a competitive imperative.

(v) End the practice of awarding business on the basis of price tag alone. Do not drive price down at the cost of quality.

(II) Recommendations regarding Directing:

(vi) Adopt and institute leadership. Do not attain control at the expense of leadership.

(vii) Break down barriers between staff areas. Develop high level of understanding

(viii) Drive out fear. Fear of losing job/punishment produces losses.

(ix) Stop to shout at workers; as these are evidence of failure to manage.

(III) Recommendations regarding Staffing:

(x) Institute training a precondition for continuous improvement.

(xi) Institute a vigorous programme of education and self-improvement.

(xii) Remove barriers that rob people of pride of workmanship. Annual performance and merit rating are the biggest obstacles.

(IV) Recommendations regarding Controlling:

(xiii)Reduce mass inspection. In fact, the greater the number of inspectors; the greater the number of defects.

(xiv)Eliminate numerical controls for workforce. Help people to ensure that targets are met.

Advantages of TQM

(i) Sharpens Competitive Edge of the Enterprise: TQM increases profitability and competitiveness of the enterprise; and helps to sharpen the organisation's competitive edge, in the globalized economy of today.

(ii) Excellent Customer Satisfaction: By focusing on customer requirements, TQM makes for excellent customer satisfaction. This leads to more and more sales, and excellent relations with customers.

(iii) Improvement in Organisational Performance: Through promoting quality culture in the organisation, TQM lead to improvements in managerial and operative personnel's performance.

(iv) Good Public Image of the Enterprise: TQM helps to build an image of the enterprise in the minds of people in society. This is due to stress on total quality system and customers' requirements, under the philosophy of TQM.

Limitations of TQM

The philosophy of TQM suffers from the two major limitations:

(i) Waiting for a Long Time: TQM requires significant change in organisation; consisting of:

1. Change in methods, processes etc. of organisation.
2. Change in attitude, behaviour etc. of people

Launching of TQM and acceptance of the philosophy of TQM requires a long waiting for the organisation. It is not possible to accept and implement TQM overnight.

(ii) Problem of Labour Management Relations: Success of TQM depends on the relationships between labour and management; because participation of people at all levels is a pre-requisite for TQM programme implementation. In many organisations,labour-management relations are quite tense. In such cases, launching, acceptance and implementation of TQM programme remains a dream for such organisations.

MARKETING MANAGEMENT

Marketing may be defined as the collection of activities undertaken by the firm to relate profitability to its market. Marketing in the modem context, is not just about the process through which exchange of goods and services takes place. Marketing has to be viewed as an integral part of the total socio-economic system which provides the framework within which activities take place.

A Good Marketing Manager should understand the total structure of the society in order to gain an insight into the true character of the total marketing system, which include channel of selection, transportation, shipping, warehousing, storage, inventory control and so on.

The term marketing can be broadly described as:

(i) Micro-marketing: the process of formulating and implementing certain strategies by a firm that ensures flow of need satisfying goods and services at a profit. Micro-marketing is responsible for product planning, pricing, promoting and distributing.

(ii) Macro-marketing: concerned with how effectively a society uses its resources and how fairly it allocates its output of goods and services.

Effective sales of products require the following skills on the part of the Marketer:

(i) Skill to Retain the Consumer
(ii) Creative Selling
(iii) Skill to Overcome Consumer Resistance
(iv) Interpersonal Skills
(v) Convincing Skill

Modern day marketing has much deviated from the past and undergone radical changes in recent years. Today, Marketing is a managerial function, consisting of activities like research into markets, demand forecasting, product planning, pricing, distribution and advertising., directed at yielding profits to the enterprises, providing satisfaction to the consumers and indirectly benefiting society at large. Marketing has grown itself into a stand-alone managerial discipline, called Marketing Management.

According to Philip Kotler, “Marketing management is the analysis, planning, implementation and control of programmes designed to bring about desired exchanges with target markets for the purpose of achieving organisational objectives. It relies heavily on designing the organisations offering in terms of the target markets needs and desires and using effective pricing, communication and distribution to inform, motivate and service the market.”

Market Mix

Marketing mix is the process of designing and integrating various elements of marketing in such a way to ensure the achievement of enterprise objectives. The elements of marketing mix have been classified under four heads—Product, Price, Place and Promotion. That is why marketing mix is said to be a combination of four P’s. (The marketer Jerome McCarthy proposed these four Ps classification in 1960)

Marketing Mix

Based upon its understanding of customers, a company develops its marketing mix of product, price, place and promotion. The elements of the marketing mix are intricately and sensitively related to each other.

- **Product**: The product provides the primary value to the customer. The customer gets interested in the company primarily because of the product or service it is producing or proposes to produce. All other elements should be reinforcing the value proposition of the product.
  In modern-day markets, as technologies and tastes change, products become out-of-date and inferior to competition. So companies must replace them with new designs and features that customer's would care & value. The challenging task here, is to include the hottest available technologies and solutions to cater the latest needs of the customer.
- **Price**: Price is the cost that customer is willing to bear for the product and the way it is made available to him. Marketers need to be very careful about pricing objectives, methods to arrive at a price and the factors which influence setting of a price.
  For example, The company gives discounts and allowances to lure customers to buy its products, which means that a company's realized price is less than its list price. In such case, if a company is generous in giving discounts and allowances, it should keep its list price high. The list price should always have negotiation margin built in it.
  Another example, If the price of a product is reduced, customers may start regarding it as an inferior quality product. If a company raises price, customers may consider it a high quality product, but there is also the risk that customers may regard the price as too high for the value that they are getting from the product. Price change, though easy to make, should always be done taking into consideration the effect the change will have on the attractiveness or otherwise of the marketing mix.
- **Promotion**: Decisions have to be made with respect to promotional mix advertising, personal selling, sales promotions, exhibition sponsorship and public relations. By these means, the target audience is made aware of the existence of the product and the benefits that it confers to customers.
  The type of promotional tool used has to gel with other elements of the marketing mix. An expensive product, like machinery, with limited number of customers should be promoted through personal contacts between buyers and salespersons.
  Advertising in the mass media would be wasteful as the number of customers is far too small, and it would be ineffective as the customer will not make a decision to buy such an expensive product based on a little information provided in an advertisement. He will require extensive information to be able to make a choice. But an inexpensive product bought by the mass market can be advertised in the mass media.

Every small aspects of a promotional tool would enhance the marketing mix. The media used, the celebrity chosen to endorse the product, the training provided to the salesperson, etc., should reflect and reinforce other elements of the marketing mix. Normally the company makes its first contact with customers through its promotional efforts. A customer does not buy a product unless he has formed certain expectations about the product. Promotion shapes this expectation of customers.

- **Place**: Place involves decisions concerning distribution channels to be used, the location of outlets, methods of transportation and inventory levels to be held. The product should be available in the right quantity, at the right time and place. Distribution channels consist of independent intermediaries such as retailers, wholesalers and distributors through which goods pass on their way to customers. These intermediaries should provide cost-effective access to the marketplace.
  Above all, these Distribution channels perform three distinct functions. They transfer products from the manufacturer to the customers, they pass information from the manufacturer to the customers, and they retrieve payment from the customers to the manufacturer.

Product Life Cycle

No product is capable to satisfy needs and wants of consumers for an unlimited period of time. Its sales and profits are subject to differ over time. The life of product can be determined by its capacity to meet market expectations. It lasts or exists as long as it satisfies its users. The concept that studies the life span of product in relation to the demand is popularly known as product life cycle.

Product life cycle is the historical study of (sales of) the product. It includes when it was introduced; when it was getting rapid acceptance; when it was on the peak of its position; when it started falling from the peak; and when it disappeared. Product passes through certain stages during its life span.

Marketing Guru Philip Kotler, defines *"The product life cycle is an attempt to recognize distinct stages in sales history of the product."*

Four stages of Product Life Cycle

1. Introduction: The product is introduced in the market.
2. Growth: The product is getting rapid acceptance and sales rise at the increasing rate.
3. Maturity (including Saturation): Sales rise, but at the decreasing rate.
4. Decline: It is the stage when sales start falling.

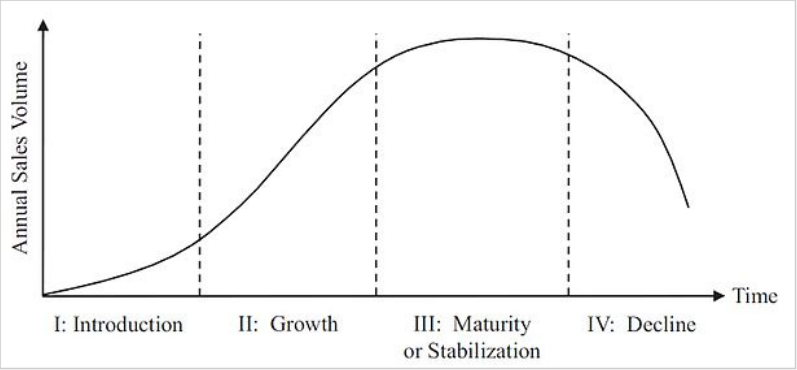


Figure above shows that product life cycle has "S" shape curve. It indicates an ideal state, and is very hard to attain

Characteristics of Product Life Cycle

The accompanying characteristics of the Four stages of PLC are quoted in the table below..

Stage	Characteristics
Market introduction stage	1. costs are very high 2. slow sales volumes to start 3. little or no competition 4. demand has to be created 5. customers have to be prompted to try the product 6. makes little money at this stage
Growth stage	1. costs reduced due to economies of scale 2. sales volume increases significantly 3. profitability begins to rise 4. public awareness increases 5. competition begins to increase with a few new players 6. increased competition leads to price decreases
Maturity stage	1. costs are decreased as a result of production volumes increasing 2. sales volume peaks and market saturation is reached 3. increase in competitors entering the market 4. prices tend to drop due to the proliferation of competing products 5. industrial profits go down
Saturation and decline stage	1. costs become counter-optimal 2. sales volume decline 3. prices, profitability diminish 4. profit becomes more a challenge of production/distribution efficiency Note: Product termination is usually not the end of the business cycle, only the end of a single entrant

Conclusion

Now a days, many people emphasize that as the nature of organizations has changed, so must the nature of management control. They claim that management shouldn't exercise any form of control, and should exist to support employee's efforts to be fully productive members of organizations and communities. Considering these arguments, it seems that writers of management literature now prefer use of the term "coordinating" rather than "controlling".

But above all the negative connotation of the word "Direct and Control", it must exist or there is no organization at all.

In the Quality Culture maintained within the organization along with its Effective Marketing strategies, lies the very existence of the Organization.