

Teachers Manual

GENERAL MANAGEMENT

For

**Science, Art, Management and Other
Post Graduate Courses**

**For Department of Technical Education
Govt. of Uttarakhand**



**ALTERNATE HYDRO ENERGY CENTRE
INDIAN INSTITUTE OF TECHNOLOGY, ROORKEE**

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Chapter 1

GENERAL MANAGEMENT

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SCOPE OF THE COURSE

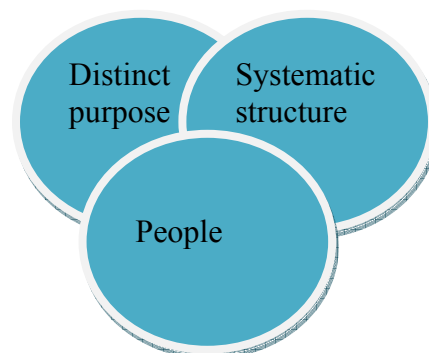
After reading chapter 1, you should be able to:

- Understand the fundamental characteristics of organization
- List the responsibility of each type of managers
- Understand the evolution of management
- Outline all approaches of management
- Explain the processes of management
- Explain the functions of management

INTRODUCTION

1.1 Organization

Organization defined generally as “Two or more people who work together in a structured way to achieve a specific goal or set of goals”. For instance, colleges or universities, hotels and your neighborhood grocery stores are all an organizations. These are all organizations because they all share three common characteristics namely distinct purpose, systematic structure and people.



Ref: Robbins and Coulter (2004)

Fig 1.1: Characteristics of Organizations

Any organization has a purpose to start business. This is typically expressed in terms of goal or set of goals. Organization is totally composed of people like workers to top managers. Fig 1.1 shows the characteristics of organizations. If people involved in the

organization, assigning responsibility and authority to people arise naturally. Who will lead the team? And who shall report to the top management? systematic structure in organization answers these questions. It involves creating rules and regulations, identifying some members as leader and giving them authority over other workers.

The organization refers to an entity that has a distinct purpose includes people or members and has a systematic structure. Organizations are broadly classified into two namely formal and informal.

A formal organization is a stable set of a description of the organization structure and the rules like policies, regulations and procedures that make up an organization.

The army and large corporations are structured very formally for an instance.

The informal organization is a concept in management practice that denotes the network, unrelated to the firm's formal authority structure. It is the aggregate of personal and social relationships that arise spontaneously as people associate with one another environment.

The informal organization can make the formal organization more effective by providing support to management, stability to the environment and useful communication channels. To begin with a simple example, this kind of relationship may exist entirely within a given institution as when a board or council elite group may have an informal, private existence, as well as its public, official, institutionalized existence. When the councilors of corporation , for example, meets informally at the mayor's home or gathers for a dinner at the hotel, this organization becomes an informal organization. The relationship between formal and informal becomes easier to understand while introducing an influential figure, not member of the institutional group, who come in to the lunch, dinner, or gathering of friends and play a part in policy making, the interrelationship begins to be more complex. Here we can say that informal groups representing combinations of formal.

1.2 Goal

Goal is generally mentioned as the purpose that an organization strives to achieve. Organizations often have more than one goal and goals are fundamental elements of organizations.

Organizations must also acquire and allocate the resources necessary to achieve their goals. All organizations depend on other organizations for their need. A cricket team cannot play without the required equipment.

1.3 Management

James Stonner et.al (2003) defined the management as

“The process of planning, organizing, leading and controlling the work of organization members and of using all available resources to reach stated organizational goals”.

All organizations have people who are responsible for helping them to achieve their goals. These people are called managers. Managers are responsible for directing the efforts made by all in the organization aimed at helping organizations achieving goals. All managers in all organizations have the same basic responsibility without considering type of organization. **Manager** who manages work, leads people and achieves results through their efforts.

1.4 Management is subject to time and human relationships

Management is dealing with matters of time and human relationships. The several elements of time in organizations are:

- Keeping in mind the past and present, management attempts to forecast the future.
- Management produces consequences and effects over time.

The importance of human relationships also involves

- Managers keep the relationships in which each one is influenced by other.
- Managers try to deal all the activities simultaneously related others.

1.5 Managerial performance

How successfully an organization achieves its objectives and satisfies social responsibilities?. This is depends on its managers. If managers do their jobs well an organization will certainly achieve its objectives or goals. This is based on the managerial performance. It is a measure of how efficient and effective a manager is. This is discussed in detail in the next section. And also how well managers determine and achieve appropriate objectives. The managerial performance is often confused with organizational performance which is a measure of how efficient and effective an organization is and how well organization acheives its objectives.

1.6 Efficiency and Effectiveness

Efficiency, the ability to do things right- is an input-output concept. An efficient manager is one who acheives outputs that measure up to the inputs like labor, materials and time used to achieve them. Effecient manager who is able to minimize the cost of the resources needed to achieve goals.

Effectiveness involves choosing right goals. A manager is called as inefficient manager when he/she selects an inappropriate goal. For an instance, if a manager produce large cars while small cars are in demand.

1.7 Types of managers

Typically, there are three levels of management in organizations:

- Top-level
- Middle-level
- First-level

The above three levels of managers form a hierarchy, in which they are ranked in order of importance. In most organizations, the number of managers at each level is such that the hierarchy resembles a pyramid, with many more first-level managers, fewer middle managers, and the fewest managers at the top level.

Each of these management levels is described below in terms of their possible job titles and their primary responsibilities and the paths taken to hold these positions.

Additionally, there are differences across the management levels as to what types of management tasks each does and the roles that they take in their jobs.



Fig 1.2: Types of Managers

1.7.1 Top-Level Managers

Top-level managers are also called as senior management or executives. These individuals are at the top one or two levels in an organization. The functions of the top managers are setting goals for the organization rather directing the day-to-day activities of the firm and direct the company to achieve them. Ultimately they are responsible for the overall performance of the organization so their decisions affect the whole firm.

In most organizations they have a great deal of managerial experience and they have promoted through the ranks of management within the company. An exception to this is a top manager who is also an entrepreneur; such an individual may start a small company and manage it until it grows enough to support several levels of management.

Some top managers may be hired from other top management positions in other companies. Conversely, they may be promoted from within and groomed for top management with management development activities, coaching, and mentoring. Succession planning is very helpful to identify high potential managers for top level.

The well known titles of such positions are Chief Executive Officer, Chief Financial Officer, Chief Operational Officer, Chairperson of the Board, President and Vice president.

1.7.2 Middle-Level Managers

Middle-level managers are responsible for carrying out the goals set by top management. They do so by setting goals for their departments and other business units. Middle managers can motivate and assist first-line managers to achieve business objectives. They may also communicate upward, by offering suggestions and feedback to top managers. Because middle managers are more involved in the day-to-day workings of a company, they may provide valuable information to top managers to help improve the organization's bottom line. They include all levels of management between the supervisory level and the top level of the organization.

Jobs in middle management vary widely in terms of responsibility and salary. Depending on the size of the company and the number of middle-level managers in the firm, middle managers may supervise only a small group of employees such as an entire business location. Middle managers may be employees who were promoted from first-level manager positions within the organization, or they may have been hired from outside the firm.

The well known titles of such positions are General Manager, Plant manager, Regional manager, and Divisional manager.

1.7.3 First-Level Managers

First-level managers are also called first-line managers or supervisors. These managers have job titles such as: Office manager, Shift supervisor, Department manager, Store manager. First-line managers are responsible for the daily management of line workers - the employees who actually produce the product or offer the service. There are first-line managers in every work unit in the organization. Although first-level managers typically do not set goals for the organization, they have a very strong influence on the company.

These are the managers that most employees interact with on a daily basis and if the managers perform poorly employees may also perform poorly may lack motivation.

In the past, most first-line managers were employees who were promoted from line positions (such as production or clerical jobs). Rarely did these employees have formal education beyond the high school level. However, many first-line managers are now a three year bachelor's degree graduate. In Fig 1.2, last two levels indicate these managers. They are many in number in an organization but authority given to them is less.

THE EVOLUTION OF MANAGEMENT

The management functions planning, organizing, leading and controlling activities have existed for thousands of years. The evidence of such organized endeavors are the Egyptian pyramids and the Great wall of china. More than 1,00,000 people involved in the construction of a pyramid for twenty years. Who directed each one what to do? Who ensured there would be enough stoned at the site to keep all workers busy? Management is the answer to such questions. Fig 1.3 shows the development of most management theories.

1.8 THE HISTORICAL CONTEXT OF MANAGEMENT

Social forces are the norms and values that characterize a culture. Early social forces allowed workers to be treated poorly; however, more recent social forces have provided

for more acceptable working conditions for workers. Social forces have influenced management theory in areas such as motivation and leadership.

Economic forces are the ideas behind the concept of a market economy such as private ownership of property, economic freedom, competitive markets and a limited role for government.

Political forces such as governmental regulations play a significant role in how organizations choose to manage themselves. Political forces have influenced management theory in the areas of environmental analysis, planning, control, organization design, and employee rights.

1.9 THE CLASSICAL PERSPECTIVE

1.9.1 Scientific management

Scientific management focuses on ways to improve the performance of individual workers. Some of the major contributors are:

Frederick W. Taylor saw workers deliberately working under their potential and designed a 4-step method to overcome this problem.

Taylor's principles of scientific Management

- The development of a science for each element of a man's work to replace the old rule-of-thumb methods.
- The scientific selection, training and development of workers instead of allowing them to choose their own tasks and train themselves as best they could.
- The development of a spirit of hearty cooperation between workers and management to ensure that work would be carried out in accordance with scientifically devised procedures.
- The division of work between workers and the management in almost equal shares, each group taking over the work for which it is best fitted instead of the former condition in which responsibility largely rested with the workers. Self-evident in this philosophy are organizations arranged in a hierarchy, systems of abstract rules and impersonal relationships between staff.

Frank and Lillian Gilbreth were associates of F.W Taylor. The Gilbreths, had experience in unionized industry. In Frank Gilbreth's early career, he was interested in standardization and method study.

While bricklaying at construction sites, no two bricklayers used exactly the same method or set of motions, he tried to find an improved method.

The result was that he was able to raise output from 1000 to 2700 bricks per day.

From their various studies the Gilbreths developed, the laws of human motion from which evolved the principles of motion economy.

They coined the term 'motion study' to cover their field of research and distinguished it with 'time study'; it is a technique that they believed should always precede method study.

The use of the camera in motion study stems from this time and the Gilbreths used micro-motion study in order to record and examine detailed short-cycled movements as well as inventing cyclographs and chronocycle graphs to observe rhythm and movement.

Henry Gantt, the third well-known pioneer in the early days of scientific management worked for F.W.Taylor in USA and is to be remembered for his humanizing influence on

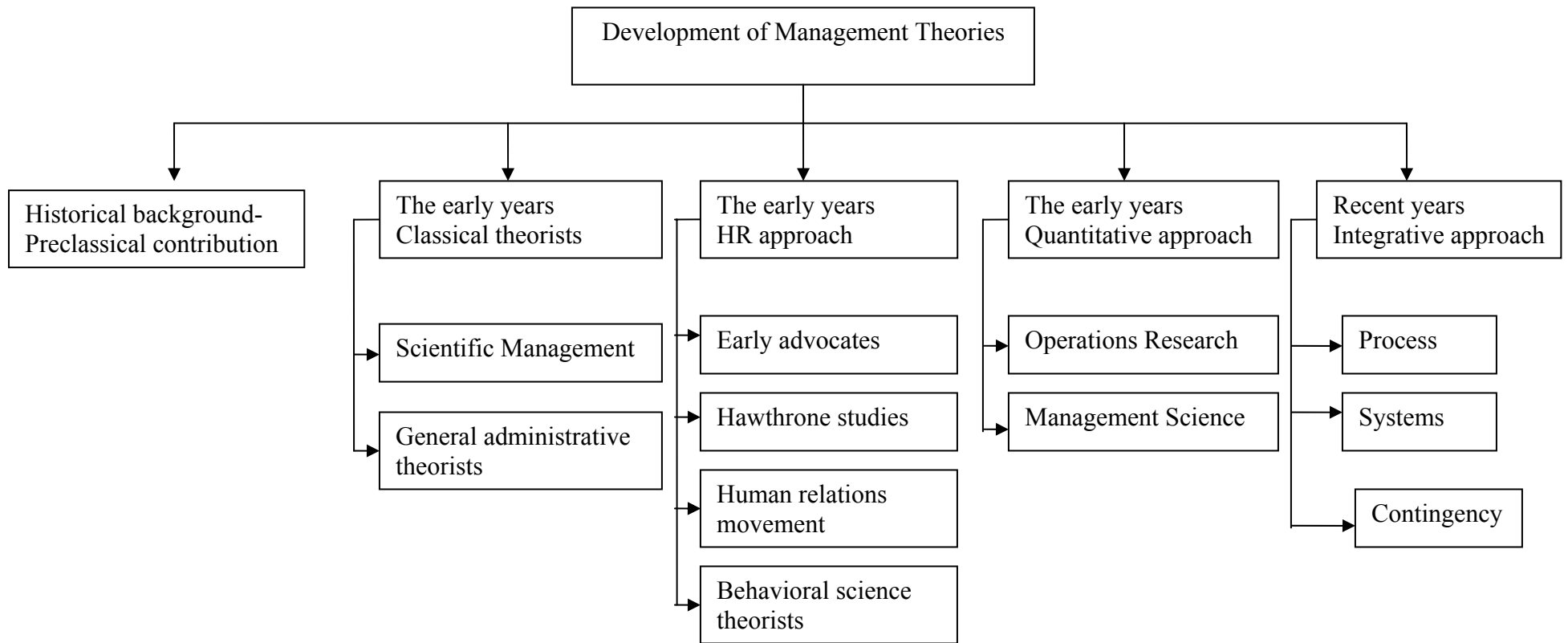


Fig 1.3: Development of major management theories

Ref: Robbins and Coulter (2004)

management, emphasizing the conditions that have favorable psychological effects on the worker.

Gantt chart

The Gantt chart is a visual display chart that shows the relationship between work planned and completed on one axis and time elapsed on the other.

1.10 GENERAL ADMINISTRATIVE THEORISTS

Administrative management focuses on managing the total organization.

Henri Fayol was the first to identify the four management functions such as Planning, Organizing, Leading and Controlling and he developed guidelines for managers to follow. These guidelines form fourteen principles for effective management.

1. **Division of Work.** Specialization provides the individual to build up experience, continuous improvement in skills. Thereby he can be more productive.
2. **Authority.** The right to issue commands, along with which must go the balanced responsibility for its function.
3. **Discipline.** Employees must obey, but this is two-sided: employees will only obey orders if management play their part by providing good leadership.
4. **Unity of Command.** Each worker should have only one boss with no other conflicting lines of command.
5. **Unity of Direction.** People engaged in the same kind of activities must have the same objectives in a single plan. This is essential to ensure unity and coordination in the enterprise. Unity of command does not exist without unity of direction but does not necessarily flows from it.
6. **Subordination of individual interest** (to the general interest). Management must see that the goals of the firms are always paramount.
7. **Remuneration.** Payment is an important motivator although by analyzing a number of possibilities, Fayol points out that there is no such thing as a perfect system.
8. **Centralization** (or Decentralization). This is a matter of degree depending on the condition of the business and the quality of its personnel.

9. **Scalar chain** (Line of Authority). A hierarchy is necessary for unity of direction. But lateral communication is also fundamental, as long as superiors know that such communication is taking place. Scalar chain refers to the number of levels in the hierarchy from the ultimate authority to the lowest level in the organization. It should not be over-stretched and consist of too-many levels.
10. **Order**. Both material order and social order are necessary. The former minimizes lost time and useless handling of materials. The latter is achieved through organization and selection.
11. **Equity**. In running a business a ‘combination of kindness and justice’ is needed. Treating employees well is important to achieve equity.
12. **Stability of Tenure of Personnel**. Employees work better if job security and career progress are assured to them. An insecure tenure and a high rate of employee turnover will affect the organization adversely.
13. **Initiative**. Allowing all personnel to show their initiative in some way is a source of strength for the organization. Even though it may well involve a sacrifice of ‘personal vanity’ on the part of many managers.
14. **Esprit de Corps**. Management must foster the morale of its employees. He further suggests that: “real talent is needed to coordinate effort, encourage keenness, use each person’s abilities, and reward each one’s merit without arousing possible jealousies and disturbing harmonious relations.”

Max Weber outlined the concept of bureaucracy based on a rational set of guidelines for structuring organizations in the most efficient manner. Bureaucracy is a system characterized by division of labor, a clearly defined hierarchy, detailed rules and regulations and impersonal relationships.

1.11 THE HUMAN RESOURCES APPROACH

1.11.1 Early Advocates

There are four individuals recognized the importance of human factors stand out as early advocates of this approach.

Robert Owen argued that money spent on improving labor was one of the best investments that business executives could make. And he claimed that showing concern for employees was highly profitable for management and would relieve human misery. He proposed an ideal workplace where working hours would be regulated, child labor would be banned, education will be provided and meals would be furnished.

Hugo Munsterberg created the industrial psychology. This is the scientific study of individuals at work to maximize their productivity. He suggested the use of psychological tests to improve employee selection, the study of human behavior in order to understand what techniques are most effective for motivating workers.

Chester Barnard considers organizations as social systems which require cooperation of human. He believed that organizations were made up of people who have interacting social relationships. Barnard introduced a idea that managers had to examine the environment and adjust the organization to maintain a state of equilibrium.

Mary Parker Follett thought that organizations should be based on a group ethic rather than individual. She argued that individual potential remained only potential until released through group association.

1.11.2 The Hawthorne studies

The Hawthorne studies were held at Western Electric and sponsored by General Electric. Elton Mayo and his colleagues controlled the lighting in one room of workers but not in another.

When the illumination was increased in the experimental group, productivity increased in both groups. The increase in productivity was attributed to the fact that the workers were having extra attention paid to them, maybe for the first time.

Other studies found that employees will not work as fast as they can when being paid piece-rate wages. Instead, they will perform to the level informally set by the group in order to be accepted by the group.

These two studies led Mayo to the conclusion that individual and social processes played a major role in shaping workers attitudes and behavior at work.

1.11.3 The human relations movement

The human relations movement, which stemmed from the Hawthorne studies, is based on the idea that a manager's concern for workers will lead to their increased satisfaction and improved performance. The movement includes the need theories of motivation, such as Maslow's hierarchy of needs, and McGregor's Theory X and Theory Y.

1.11.4 Behavioral Science Theorists

Jeffrey Pfeffer, Kenneth Thomas were contributed to the development of organizational behavior. Organizational behavior takes a holistic view of behavior by addressing individual, group, and organization processes. Their contributions and limitations are listed below:

Contributions

- Gave insights into interpersonal processes in organizations such as motivation and group dynamics.
- Focused managerial attention on these processes.
- Challenged the view of employees as tools.

Limitations

- The complexity of human behavior makes difficult to predict.
- Managers may be reluctant to adopt some of the behavioral concepts.
- Contributions are often not communicated to the practicing managers in an understandable form.

1.12 THE QUANTITATIVE APPROACH

Quantitative approach to management includes the applications of statistics, optimization models and computer simulations. It has contributed most directly to management decision making in planning and control. Management science and Operations Research are specifically focused on the development of mathematical models. These models help organizations to try out various activities with the use of a computer. Modeling can help managers locate the best way to do things and save money and time.

Contributions

- Developed sophisticated quantitative techniques to assist in decision making.

- Models have increased our awareness of complex organizational processes and has aided in the planning and controlling processes.

Limitations

- Cannot fully explain or predict behavior of people.
- Mathematical sophistication may come at the expense of other important skills.
- Models may require unrealistic or unfounded assumptions.

1.13 INTEGRATIVE APPROACH

1.13.1 The systems approach

A system is an interrelated set of elements functioning as a whole. An organization as a system is composed of four elements:

- Inputs (material or human resources),
- Transformation processes (technological and managerial processes),
- Outputs (products or services), and
- Feedback (reactions from the environment)

The two basic types of systems are open and closed. *Open systems* are systems that interact with their environment. Subsystems are systems within a broader system.

Closed systems are systems that neither influenced by nor with their environment. Fig 1.4 shows an open system perspectives in an organization. Inputs like Raw materials, Human resources, Capital, Technology and Information are required for a business firm. The transformation process turns these inputs into finished products or services through work activities, management activities and operations methods.

Products & services, Financial results such as break even, profit or loss, Information, Human results are the outputs from the system. Human results show the employees job satisfaction. The above activities are mainly depends on other important factor environment. It includes supplier of the organization, banks, government agencies and customers.

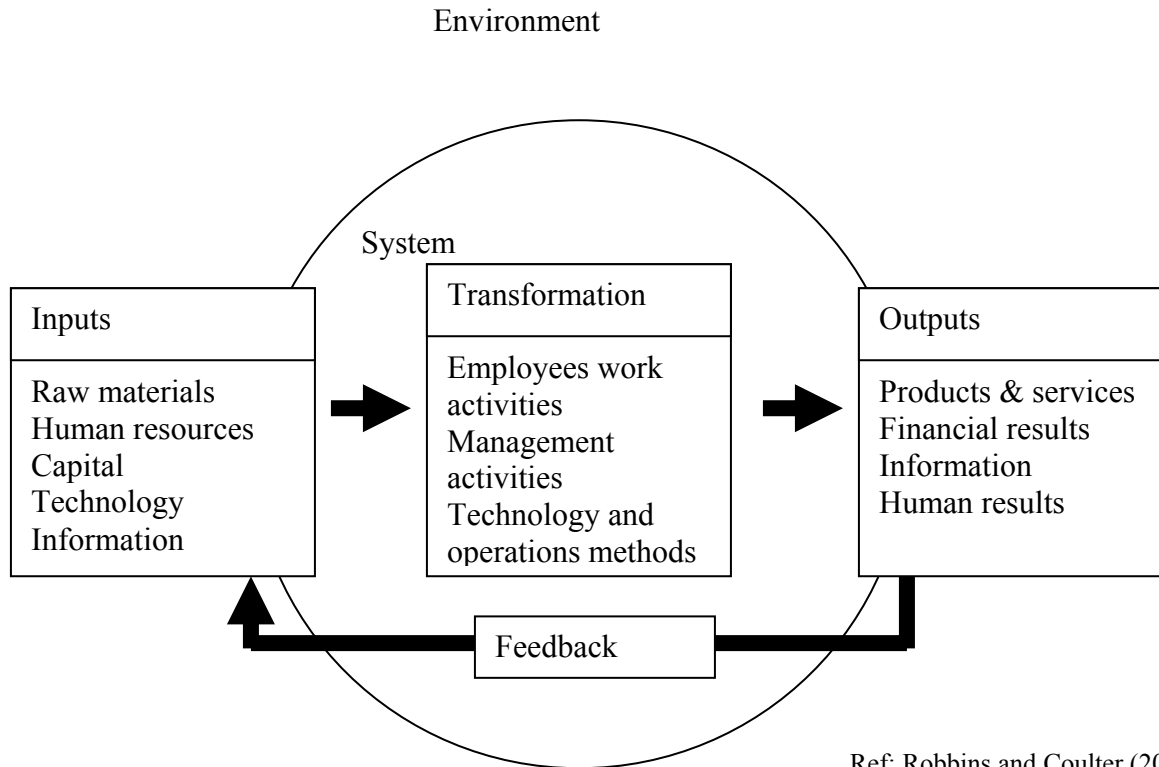


Fig 1.4: The Systems Approach

1.13.2 The process approach

This approach is originally introduced by Henri Fayol based on the management functions such as planning, organizing, leading and controlling. These are explained in the following sections.

1.13.3 The contingency approach

Appropriate managerial behavior depends on the elements of the situation. Universal perspectives tried to identify the "one best way" to manage organizations. Contingency perspective argues that universal theories cannot be applied to organizations because each is unique. The popular contingency variables are organization size, routines of task technology, environmental uncertainty and individual differences.

MANAGEMENT PROCESS

1.14 Planning

Planning typically includes identifying goals, objectives, methods, resources needed to carry out methods, responsibilities and dates for completion of tasks. Examples of planning are strategic planning, business planning, project planning, staffing planning, advertising and promotions planning, etc. Fig 1.5 shows the typical management process.

The following are phases in planning:

1. Keep in mind the mission.

Planners have in mind some overall purpose or result that the plan is to achieve during planning. During planning, it's critical to reference the mission, or overall purpose, of the organization.

2. Consider system environment.

It's important to conduct an environmental scan. This scan usually involves considering various driving forces, or major influences, that might effect the organization.

3. Analyze the Situation

Planners often conduct a "SWOT analysis". (SWOT is an acronym for considering the organization's strengths, weaknesses, opportunities and threats faced by the organization). During this analysis, planners also can use a variety of assessments, or methods to "measure" the health of systems.

4. Establish Goals

Based on the analysis and alignment to the overall mission of the system, planners establish a set of goals that build on strengths to take advantage of opportunities, while building up weaknesses and warding off threats.

5. Establish Strategies to reach goals

The particular strategies chosen depend on matters of practicality and efficiency.

6. Establish Objectives

Along the way to achieve goals, objectives are selected to be timely and indicative of progress toward goals.

7. Associate Responsibilities and Time Lines with each objective
 Responsibilities are assigned, including for implementation of the plan, and for achieving various goals and objectives. Ideally, deadlines are set for meeting each responsibility.

8. Write and Communicate a Plan Document

The above information is organized and written in a document which is distributed around the system.

9. Acknowledge Completion and Celebrate Success

This critical step is often ignored which can eventually undermine the success of many of your future planning efforts. The purpose of a plan is to address a current problem or pursue a development goal. It seems simplistic to assert that you should acknowledge if the problem was solved or the goal met. However, this step in the planning process is often ignored in lieu of moving on the next problem to solve or goal to pursue.



Fig 1.5 Management Process

1.15 Organizing

Simply say that organizing is allocating and configuring resources to accomplish the preferred goals and objectives establishing during the planning processes. In the next chapter this process will be explained more elaborately.

1.16 Leading

Leading is establishing direction and influencing people to follow that direction. In management we deal mostly with humans. Therefore to achieve our objectives we have to motivate and lead people who are relevant to achievement of our objectives. When we lead people, motivate them and constantly communicate with them, they will be interested in carrying out what had been allocated to them. Unless people are properly led they will not do the intended task. People need to be constantly motivated and directed to perform the intended task we expect out of them. Then achievement of our objective will be certain.

1.17 Controlling

Controlling is that we must ensure that all our planning, organizing and leading in fact move us towards the established objectives. This is, while planning, organizing and leading are carried out as a process, it must be ensured that we measure the ongoing performance of the task and compare such current performance with the established objectives, to see whether we are heading towards the right directions.

If it is clear that our objectives may not be achieved then some corrective actions must be taken to ensure that we are infact heading in the right directions to achieve the objectives which were predetermined.

FUNCTIONS OF MANAGEMENT

1.18 Planning

Planning is concerned with the future impact of today's decisions. It is the fundamental function of management from which the other four stem. The need for planning is often apparent after the fact. However, planning is easy to postpone in the short-run.

The organizing, staffing, leading and controlling functions stem from the planning function. The manager is ready to organize and staff only after plans to reach the goals. Likewise, the leading function, influencing the behavior of people in the organization, depends on the goals to be achieved. Finally, in the controlling function, the determination of whether or not goals are being accomplished and standards met is based on the planning function. The planning function provides the goals and standards that drive the controlling function.

Planning is important at all levels of management. However, its characteristics vary by level of management. Fig 1.6 shows the various functions of management.

1.19 Staffing

Management teams on successful organizations doing well at many human resource management skills. Staffing (including recruiting, selecting, hiring and training of employees) is among the skills that become more important as the complexity and overall level of performance of organizations business increases. With increasing size and improving performance comes people complexity: more things accomplished through employees, more delegation to key employees and more reliance on employees to maintain a routine that assures superiority.

The organizing function of management defines each position or category of positions on the organization. Staffing follows with the filling and keeping filled all positions on the organization.

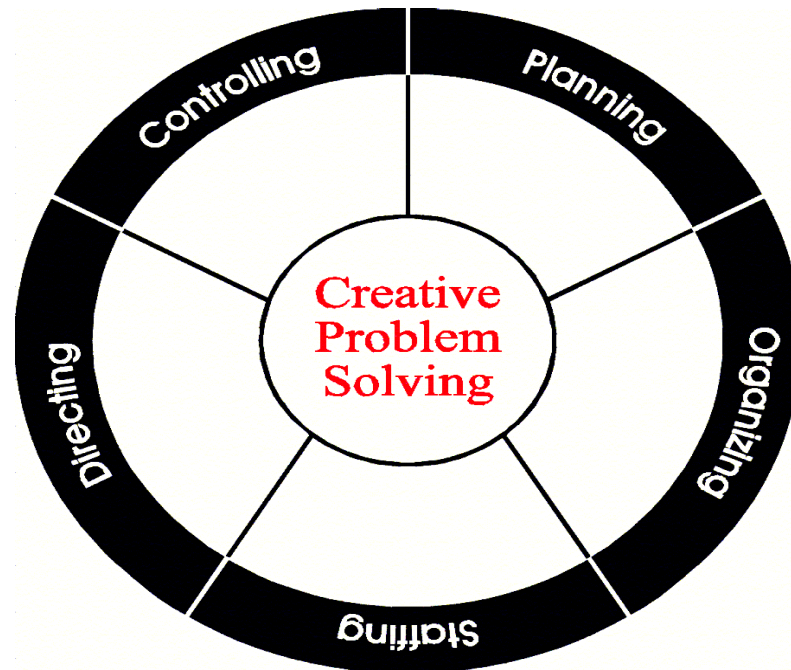


Fig 1.6: Functions of management

Recruiting a pool of applicants for a position, selecting new employees from among the pool of applicants, training new employees and retaining experienced employees are the key elements of the staffing function.

Practically all organizations function without a Human Resource Department. The organization human resource managers must deal with factors external to the company such as labor laws and regulations, labor markets, practices of other employers. Internal factors such as policies regarding family members entry into the business, conflict between family and business goals and limited opportunities for promotion because of flat organization charts must be dealt with. Staffing has both short-run and long-run effect. In the short-run, positions must be kept filled with qualified people who can get the work done. In the long run, development of top and middle level management personnel for business continuity into the next generation tops the list of staffing challenges.

Staffing success depends heavily on the planning and organizing functions of management. In planning, both firm goals and employees' goals are considered. A business functions best when business and employee goals are compatible. Job analysis leads to job specifications and job descriptions. In developing job specifications, the

necessary knowledge, skills and abilities for each position are determined. Job descriptions identify specific tasks for each position. Full success in staffing rarely comes without analyzing the jobs on the farm, determining what is needed for success in each job and writing a description of the job.

The following assumptions provide the context of staffing

1. The mission for the farm has been given careful attention by top management and distributed to the management team and all employees, i.e., the reasons the farm is in business are known.
2. A management team is in place and able to divide up responsibilities. Top management is willing and able as needed to delegate responsibilities and authority.
3. Key positions like machinery person, or a full-time office person are being filled. The process for filling key positions can be modified for part-time and temporary positions.
4. The person hired will be trained to carry out the responsibilities of the position, i.e., it is not necessary to hire a person who already knows how to do the job.
5. No selection process can guarantee selection success. Even if the "right" person was hired based on all the information available to the employer at the time the decision was made, six months, a year or three years later, it may seem that the "wrong" person was hired.

1.20 Leading

Directing or leading is influencing people's behavior through motivation, communication, group dynamics, leadership and discipline. The purpose of directing is to channel the behavior of all personnel to accomplish the organization's mission and objectives while simultaneously helping them accomplish their own career objectives.

The directing function gives the manager an active rather than a passive role in employees performance, conduct and accomplishments. Managers accomplish their objectives through people. In blaming others for her or his human resource problems, a manager is denying the management responsibilities inherent in the directing function. The directing function gives managers a second responsibility: helping people in the organization accomplish their individual career goals. Organizations do not succeed

while their people are failing. Helping people in the organization with career planning and professional development is an integral part of the directing function.

The directing function in managing for success has included the motivation, communication, performance appraisal, discipline and conflict management.

Motivation

Selection, training, evaluation and discipline cannot guarantee a high level of employee performance. Motivation, the inner force that directs employee behavior, also plays an important role. Highly motivated people perform better than unmotivated people. Motivation covers up ability and skill deficiencies in employees. Such truisms about motivation leave employers wanting to be surrounded by highly motivated people but unequipped to motivate their employees. Employers and supervisors want easily applied motivation models but such models are unavailable.

Motivation probably tops the list of complex activities with which labor managers deal. Their intuition suggests an easy answer, "I want everyone around here to be motivated." They often blame employees for their lack of motivation and performance problems. Employees on the other hand often blame any performance problems they may have on external factors - their supervisors, equipment, training, co-workers, weather, unrealistic demands made on them, pressures at home, lack of recognition etc., etc. Despite the conflicting perceptions held by employers and employees, employers must deal with employee motivation.

Three ways of looking at motivation are: needs, rewards and effort. The needs approach stems from the notion that peoples' unsatisfied needs drive their behavior. Figure out a person's needs, satisfy the needs and the person will be motivated. The rewards approach is based on the expectation that rewarded behavior is repeated. Giving a person a bonus for excellent performance during a difficult harvest period encourages the person to make a special effort during the next difficult harvest. The effort approach to motivation is based on the expectation that effort brings the worker what he or she wants. The effort approach includes a assumption that the employer is fair, i.e., effort is recognized and rewarded. Managers cannot reduce motivation to a simple choice of one of these

approaches. Each of the three approaches contributes to an understanding of motivation and how motivation varies person to person and over time.

The most effective motivation for employees comes from within each employee, i.e., self-motivation. Possible indicators of self-motivation include: past accomplishments in school, sports, organizations and work; stated career goals and other kinds of goals; expertise in one or more areas that shows evidence of craftsmanship, pride in knowledge and abilities, and self-confidence; an evident desire to continue to learn; and a general enthusiasm for life.

1.21 Controlling

Controlling is a four-step process of establishing performance standards based on the firm's objectives, measuring and reporting actual performance, comparing the two, and taking corrective or preventive action as necessary.

Performance standards come from the planning function. No matter how difficult, standards should be established for every important task. Although the temptation may be great, lowering standards to what has been attained is not a solution to performance problems. On the other hand, a manager does need to lower standards when they are found to be unattainable due to resource limitations and factors external to the business.

Corrective action is necessary when performance is below standards. If performance is anticipated to be below standards, preventive action must be taken to ensure that the problem does not recur. If performance is greater than or equal to standards, it is useful to reinforce behaviors that led to the acceptable performance.

Characteristics of the Control Process

The control process is cyclical which means it is never finished. Controlling leads to identification of new problems that in turn need to be addressed through establishment of performance standards, measuring performance etc.

Employees often view controlling negatively. By its very nature, controlling often leads to management expecting employee behavior to change. No matter how positive the changes may be for the organization, employees may still view them negatively.

Control is both anticipatory and retrospective. The process anticipates problems and takes preventive action. With corrective action, the process also follows up on problems.

Ideally, each person in the business views control as his or her responsibility. The organizational culture should prevent a person walking away from a small, easily solvable problem because "that isn't my responsibility." In customer driven businesses, each employee cares about each customer. In quality driven dairy farms, for example, each employee cares about the welfare of each animal and the wear and tear on each piece of equipment. Controlling is related to each of the other functions of management. Controlling builds on planning, organizing and leading.

SUMMARY

Management is the the process of planning, organizing, leading and controlling the work of organization members and of using all available resources to reach stated organizational goals. Planning, organizing, staffing, leading, and controlling are the functions carried out by managers. At all organizational levels, organizing is an essential activity but the skills required at the organizational level are changing nature.

Many writers and practitioners have contributed to the development of management thought. The major contributors and their works are listed in evolution of management. The management process approach draws from other theories of management and integrates them into a total system of managing. The organization is an open system that operates within and interacts with the environment. The system approach to management includes inputs from the external environment and from claimants, the transformation process, the communication system, external factors, outputs, and a way to reenergize the system.

FOR DISCUSSION

1. How would you define management? Does your definition differ from one offered in this material? Explain.
2. How do the required managerial skills differ in the organizational hierarchy?
3. What are the managerial functions?
4. What are the differences between productivity, effectiveness, and efficiency?
5. What are the managerial functions?
6. Identify the various approaches to management analysis. Discuss their characteristics and contributions as well as their limitations.

SUGGESTED TEXT BOOKS

1. Stoner J.A.F, Freeman E and Daniel Gilbert, (2003) “Management”, 6th Edition, Pearson Education, New Delhi.
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Chapter 2

ORGANIZATIONAL DESIGN AND STRUCTURE

ORGANIZATIONAL DESIGN AND STRUCTURE

SCOPE OF THE COURSE

After reading chapter 2, you should be able to:

- Draw the distinction between line and staff authority
- Explain the use of organization chart
- Understand span of control
- Elaborate the horizontal dimensions of organizations
- Explain types of organizational structure
- Understand organization design

BASICS OF ORGANIZATIONS

Organization is defined as a unit within a company or an entity within which many activities are managed as a whole. All activities within an organization share common goals. Organizing is the process of creating an organization's structure that is a framework expressed by its degree of complexity, formalization and centralization. Degree of complexity refers the amount of differentiation in the organization and shows the difficulty to coordinate the people and their activities. Directing the behavior of all the people in an organization, certain rules and policies are to be formalized. Centralization is the process by which the activities of an organization, particularly those regarding decision-making, become concentrated within a particular location and/or group. Decentralization is any of various means of more widely distributing decision-making to bring it closer to the point of service. Organization Design is a process for integrating people, information, and technology toward the successful achievement of organizational outcomes. It seeks to optimize human achievement. When a manager develops or changes an organization structure, he/she is engaged in organization design.

2.1 BUILDING THE VERTICAL DIMENSION OF ORGANIZATIONS

2.1.1 UNITY OF COMMAND

It refers to the principle that a subordinate should have one and only one superior to whom he or she is directly responsible. That is no person should report to two or more superior.

2.1.2 AUTHORITY AND RESPONSIBILITY

Organizational structure involves the designation of jobs within an organization and the relationships among those jobs. There are so many ways to structure jobs within an organization, but two of the most important forms are simple line structures and line and staff structures. In a line organization, top management has complete control and the chain of command (the authority entitles a manager to direct the work of a subordinate) is clear and simple. The chain of command is shown in Fig 2.1 and explained more on the following section. For an example, small business in which the top manager may be the owner is positioned at the top of the organizational structure and has clear "lines" of distinction between him and his subordinates.

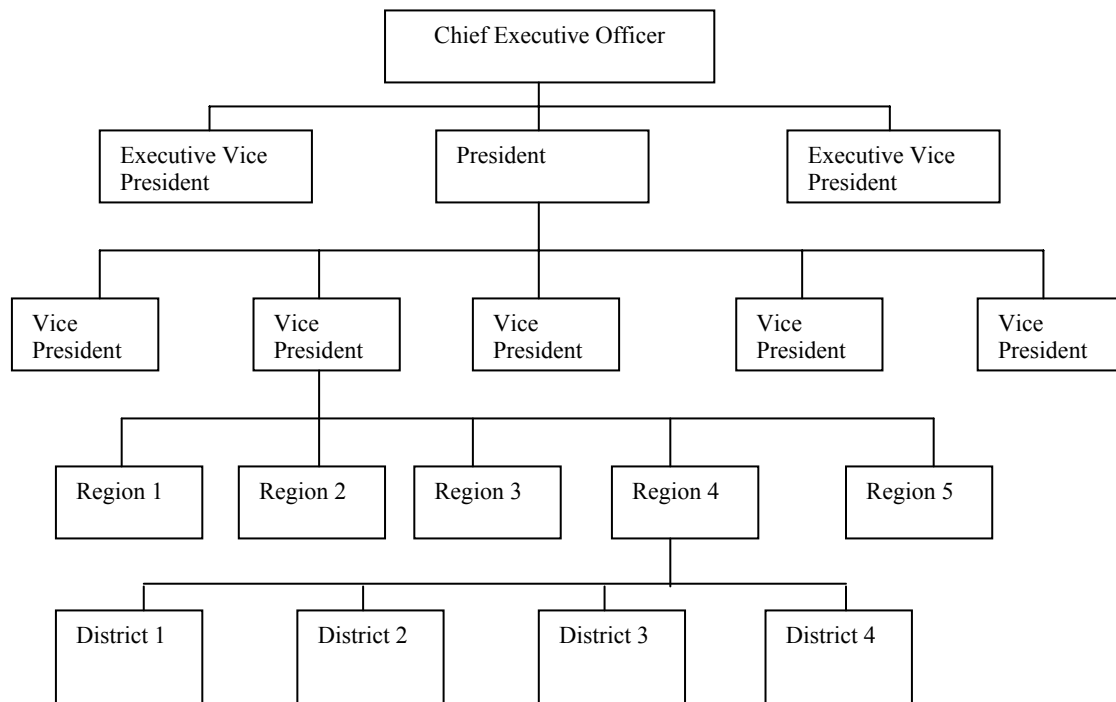


Fig 2.1: The chain of command

The line and staff organization combines the line organization with staff departments. These staff departments support and advise line departments. Most medium and large-

sized firms comprise line and staff type organizational structures. The distinguishing characteristic between simple line organizations and line and staff organizations is the multiple layers of management within line and staff organizations. Several advantages and disadvantages are present within a line and staff organization. An advantage of a line and staff organization is

- The availability of technical specialists
- Staff experts in specific areas are incorporated into the formal chain of command.

The main disadvantage is conflict between line and staff personnel.

Line and Staff Positions

The primary and secondary positions exist within a line and staff organization. Some positions are primary to the company's mission, whereas others are secondary in the form of support and indirect contribution. Although positions within a line and staff organization can be differentiated in several ways, the simplest approach classifies them as being either line or staff. Fig 2.2 illustrates the line and staff positions.

A line position is directly involved in the day to day operations of the organization, such as producing or selling a product. Line positions are occupied by line personnel and line managers. Line personnel carry out the primary activities of a business and are considered essential to the basic functioning of the organization. Line managers make the majority of the decisions and direct line personnel to achieve company goals. Line manager is a marketing executive, for an example.

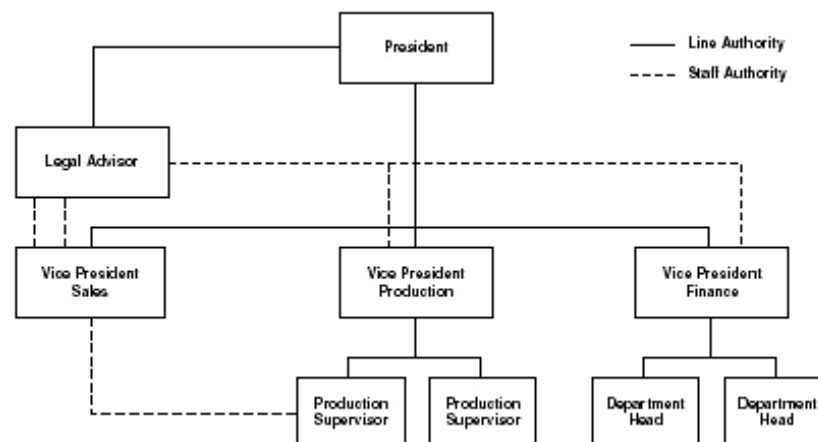


Fig 2.2: Line and Staff Organization

Although a marketing executive does not actually produce the product, he or she directly contributes to the firm's overall objectives through market forecasting and generating product demand. Staff positions serve the organization by indirectly supporting line functions. Staff positions consist of staff personnel and staff managers. Staff personnel use their technical expertise to assist line personnel and aid top management in various business activities. Staff managers provide support, advice and knowledge to other individuals in the chain of command.

Although staff managers are not part of the chain of command related to direct production of products, they do have authority over personnel. An example of a staff manager is a legal adviser. He or she does not actively engage in profit-making activities, but does provide legal support to those who do. Therefore staff positions whether personnel or managers engage in activities that are supportive to line personnel.

Line and Staff Authority

Authority within a line-and-staff organization can be differentiated. Three types of authority are present: line, staff, and functional. Line authority is the right to carry out assignments and exact performance from other individuals.

Line Authority

Line authority flows down the chain of command. For example, line authority gives a production supervisor the right to direct an employee to operate a particular machine and it gives the vice president of finance the right to request a certain report from a department head. Therefore, line authority gives an individual a certain degree of power relating to the performance of an organizational task.

The line authority does not ensure effective performance and is not restricted to line personnel. The head of a staff department has line authority over his or her employees by virtue of authority relationships between the department head and his or her directly-reporting employees.

Staff Authority

Staff authority is the right to advise line authority. For an example, human resource department employees help other departments by selecting and developing a qualified workforce. A quality control manager aids a production manager by determining the acceptable quality level of products or services at a manufacturing company by initiating quality programs and carrying out statistical analysis to ensure compliance with quality standards. Therefore, staff authority gives staff personnel the right to offer advice in an effort to improve line operations.

2.1.3 ORGANIZATION CHART

In a business of more than one person, unless the business has equal partners then there are managers and subordinates. Subordinates are workers controlled by the manager. A hierarchy describes the structure of the management from the top of the company i.e., the managing director through to the shop floor worker who reports to their foreman in a business. The hierarchy of a business is usually best understood by drawing an organization chart showing which levels of management and employees report to whom.

The following Fig 2.3 shows a typical organization chart.

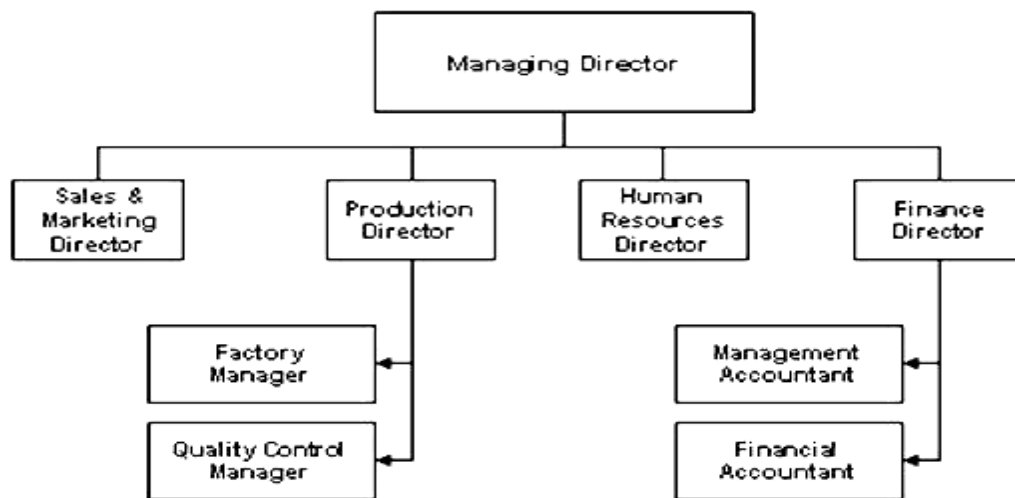


Fig 2.3: organization Chart

2.1.4 SPAN OF CONTROL

A span of control is the number of people who report to one manager in a hierarchy. That is how many subordinates a manager can effectively and efficiently supervise. The more people under the control of one manager are the wider of the span of control and it leads to ineffective and dangerous span of control. The Less people under the control of one manager are the narrower span of control and it leads to effectiveness. The following figure 2.4 and 2.5 shows the narrower and broader span of control. Fig 2.6 shows the effective span of control.

The advantages of a narrow span of control are:

- Manager could communicate quickly with the employees under them and control them more easily
- Feedback from the workers will be more effective
- Less management skill required

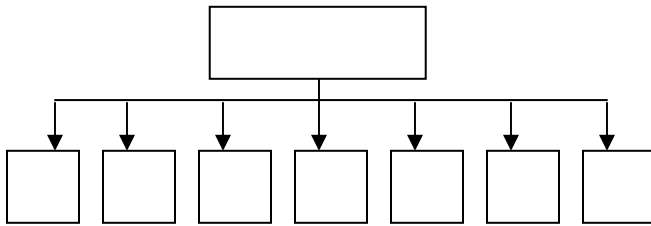


Fig 2.4: Broader span of control

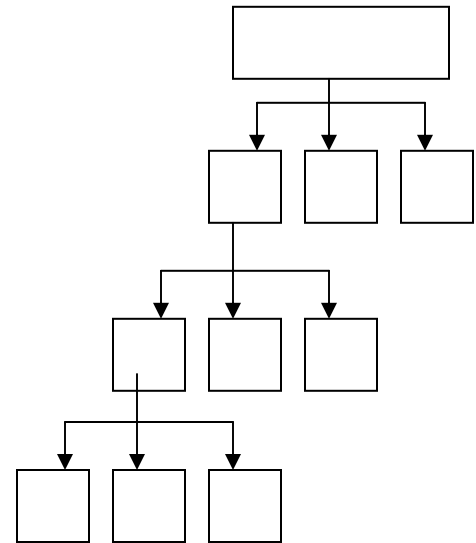


Fig 2.5: Narrower span of control

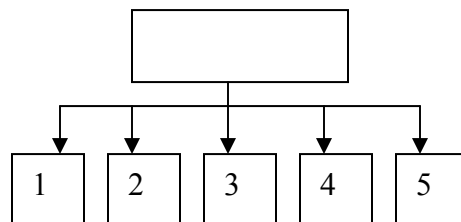


Fig 2.6: Optimum span of control

The advantages of wide span of control are:

- There are less layers of management to pass an information so the information reaches more employees faster
- It costs less money to run a wider span of control because a business does not need to employ as many managers

The width of the span of control depends on:

The type of product

Products which are easy to make or deliver will need less supervision and so can have a wider span of control

Skills of managers and workers

A more skillful workforce can operate with a wider span of control because they will need less supervision. Based on decision making organization is classified in to tall or flat organization. A tall organization (Fig 2.4) has a larger number of managers with a narrow span of control whilst a flat organization (Fig 2.3) has few managers with a wide span of control. A tall organization can suffer from having too many managers and decisions can take a long time to reach the bottom of the hierarchy. But, a tall organization can provide good opportunities for promotion and the manager does not have to spend so much time managing the staff

Chain of command

It is the line on which orders and decisions are passed down from top to bottom of the hierarchy. In a hierarchy the chain of command means that a production manager may be higher up the hierarchy but will not be able to tell a marketing person what to do.

The advantages of hierarchies are:

- Helps to create a clear communication line between the top and bottom of the business and this improves co-ordination and motivation
- Create teams and motivation is advantage of working in teams.

The disadvantages of hierarchies are:

- Departments work for themselves and not the greater good of the business.
- Departments do not see the whole picture in making decisions.
- Hierarchies can be inflexible and difficult to adjust,

2.1.5 CENTRALIZATION

Organizations with a centralized structure have several layers of management that control the organization by maintaining a high level of authority. With a centralized structure, line and staff employees have limited authority to carry something out without prior approval. This organizational structure tends to focus on top-down management, whereby executives at the top communicate by telling middle managers. Then middle managers tell first-level managers who then tell the staff what to do and how to do. Since this organizational structure tends to be fairly bureaucratic, employees have little freedom. Centralized organizations are known for decreased span of control which has a limited number of employees report to a manager. And manager then reports to the next management level (Fig 2.7).

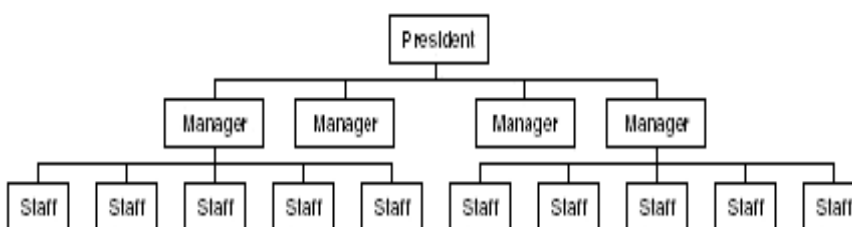


Fig 2.7: Centralized organizational Structure

2.1.6 DECENTRALIZATION

Because of more management cost in a centralized organization, many organizations continue to downsize into a more decentralized structure. Decentralization seeks to eliminate the unnecessary levels of management and to place authority in the hands of first line managers and staff. Thus it widens the span of control, with more employees reporting to one manager. Because more employees are reporting to a single manager than before, the managers are forced to delegate more work and to hold the employees more accountable. Downsizing has also helped to change the flow of communication, so that top management hears staff concerns and complaints in a more direct manner and

management has a more hands-on approach. The hands-on approach involves less bureaucracy which means there is a faster response to situations that demand immediate attention. This structure also takes advantage of bottom-up communication, with staff issues being addressed in a timely manner (Fig 2.8).

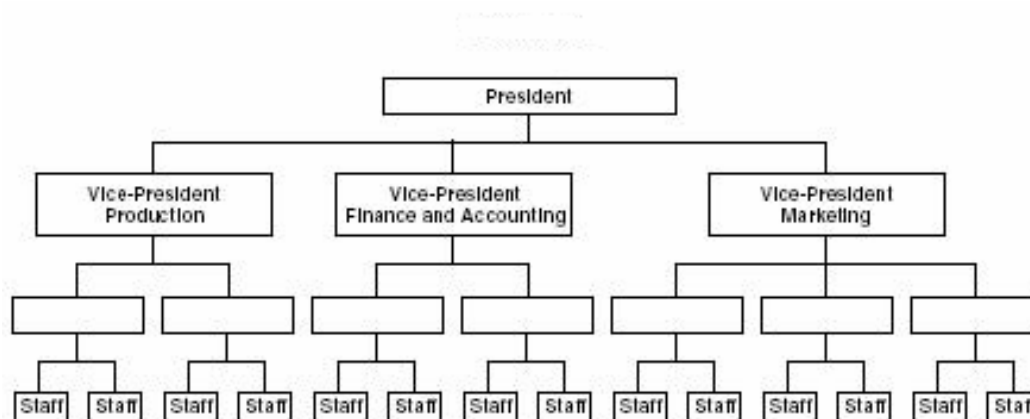


Fig 2.8: Decentralized organizational Structure

2.2 BUILDING THE HORIZONTAL DIMENSION OF ORGANIZATIONS

2.2.1 DIVISION OF LABOR

Division of labor means that instead of giving the entire job to a worker, just broken down the job into a number of steps and each step being completed by separate workers. This allows the individual to specialize in a particular area of the job rather than an entire activity. Assembly line production is one of the best examples of division of labor. It makes use of the diversity of skills and capabilities which is possessed by the employee. If all workers involve in all step of production processes, performing most demanding and least demanding jobs will be easy. Hereby division of labor is focused as an unending source of increased productivity.

2.2.2 DEPARTMENTALIZATION

Organizations can be divided into various departments with individuals who specialize in a given area such as marketing, finance, sales, and so forth. Having each unit to perform specialized jobs is known as departmentalization. Departmentalization is done according to five major categories:

- Product, which requires each department to be responsible for the product being manufactured
- Geographic, which divides the organization based on the location of stores and offices
- Customer, which separates departments by customer type
- Functional, which breaks departments into specialty areas;
- Process, which creates departments responsible for various steps in the production process.

All of the above categories of departmentalization are indicated in fig.2.9.

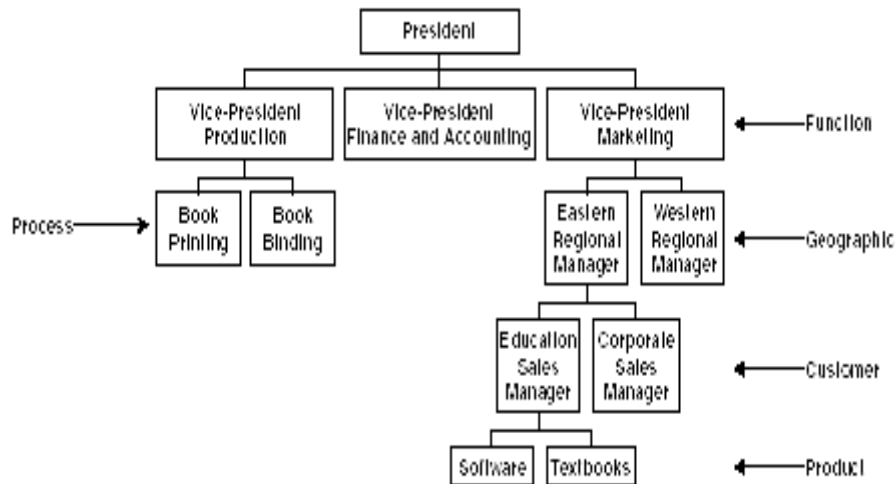


Fig 2.9: Departmentalization

Functional Departmentalization

Every organization of a given type must perform certain jobs in order to do its work. For example, key functions of a manufacturing company include production, purchasing, marketing, accounting, and personnel. Grouping jobs that require the same knowledge, skills, and resources allows them to be done efficiently and promotes the development of greater expertise. A disadvantage of functional groupings is that people with the same skills and knowledge may develop a narrow departmental focus and have difficulty in appreciating any other view of what is important to the organization; in this case, organizational goals may be sacrificed in favor of departmental goals. In addition, coordination of work across functional boundaries can become a difficult management

challenge especially as the organization grows in size and spreads to multiple geographical locations.

Geographic Departmentalization

Organizations that are spread over a wide area may find advantages in organizing along geographic lines so that all the activities performed in a region are managed together. In a large organization, simple physical separation makes centralized coordination more difficult. Also important characteristics of a region may make it advantageous to promote a local focus. For example, marketing a product in USA may have different requirements than marketing the same product in Southeast Asia. Companies that market products globally sometimes adopt a geographic structure. In addition, experience gained in a regional division is often excellent training for management at higher levels.

Product Departmentalization

Large, diversified companies are often organized according to product. All the activities necessary to produce and market a product or group of similar products are grouped together. In such an arrangement, the top manager of the product group typically has considerable autonomy over the operation. The advantage of this type of structure is that the personnel in the group can focus on the particular needs of their product line and become experts in its development, production, and distribution. A disadvantage, at least in terms of larger organizations, is the duplication of resources. Each product group requires most of the functional areas such as finance, marketing, production, and other functions. The top leadership of the organization must decide how much redundancy it can afford.

Customer/Market Departmentalization

An organization may find it advantageous to organize according to the types of customers it serves. For example, a distribution company that sells to consumers, government clients, large and small businesses may decide to base its primary divisions on these

different markets. Its personnel can then become proficient in meeting the needs of these different customers. In the same way, an organization that provides services such as accounting or consulting may group its personnel according to these types of customers. Figure 2.10 depicts an organization grouped by customers and markets.

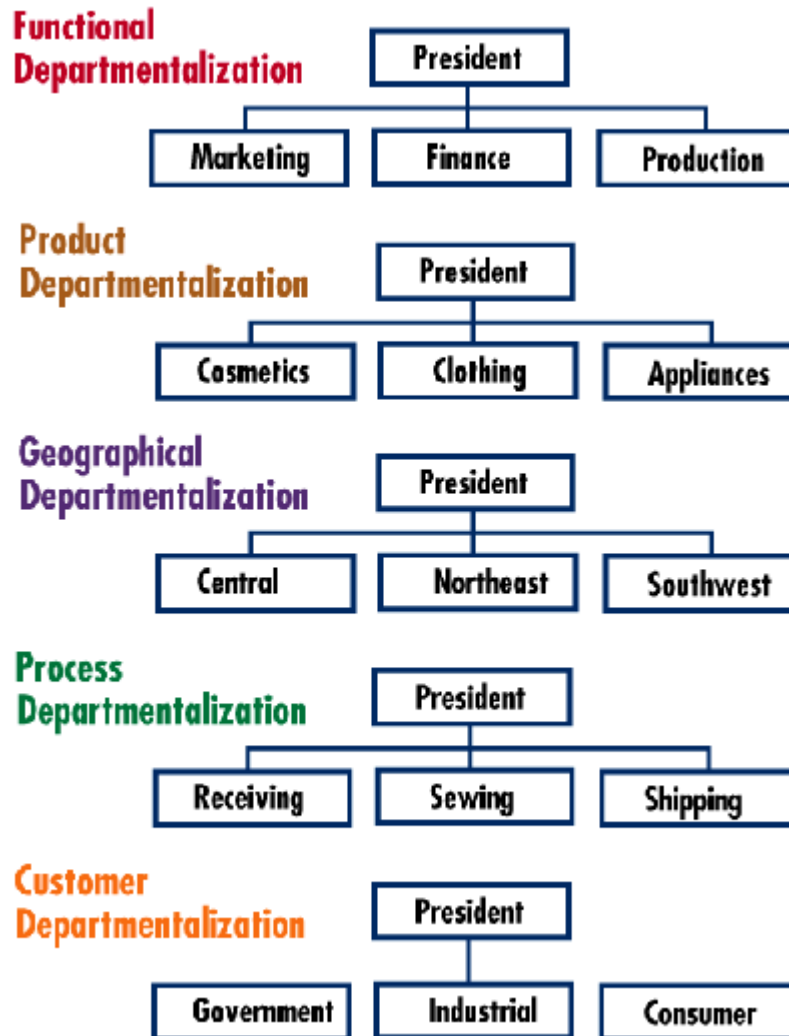


Fig 2.10: Types of departmentalization

2.2.3 MATRIX ORGANIZATIONAL STRUCTURE

Some organizations find that none of the afore-mentioned structures meet their needs. One approach that attempts to overcome the inadequacies is the matrix structure, which is the combination of two or more different structures. Functional departmentalization commonly is combined with product groups on a project basis. For example, a product

group wants to develop a new addition to its line; for this project, it obtains personnel from functional departments such as research, engineering, production, and marketing. These personnel then work under the manager of the product group for the duration of the project, which can vary greatly. These personnel are responsible to two managers. Fig 2.11 shows such type of organization. One advantage of a matrix structure is that it facilitates the use of highly specialized staff and equipment.

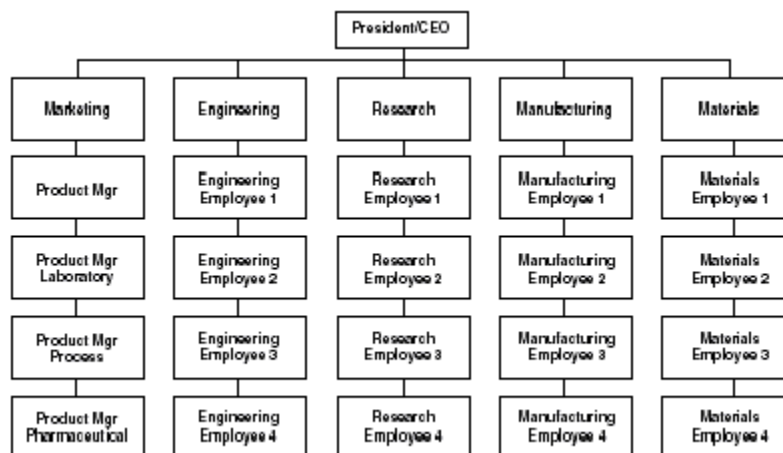


Fig 2.11: Matrix Organizational Structure

The disadvantages of a matrix organization arise from the dual reporting structure. The organization's top management must take particular care to establish proper procedures for the development of projects and to keep communication channels clear so that potential conflicts do not arise. Top management is responsible for arbitrating such conflicts, but in practice power struggles between the functional and product manager can prevent successful implementation of matrix structural arrangements. Besides the product/function matrix, other bases can be related in a matrix. Large multinational corporations that use a matrix structure most commonly combine product groups with geographic units. Product managers have global responsibility for the development, manufacturing, and distribution of their own product or service line, while managers of geographic regions have responsibility for the success of the business in their regions.

2.2.4 STRATEGIC BUSINESS UNITS

Strategic Business Units (SBU) generally are set up like separate companies, with full profit and loss responsibility invested in the top management of the unit often the president of the unit of the larger corporation. This manager is responsible to the top management of the corporation. This arrangement can be seen as taking any of the aforementioned departmentalization schemes. The SBUs might be based on product lines, geographic markets, or other differentiating factors. Figure 2.12 depicts SBUs organized by geographic area.

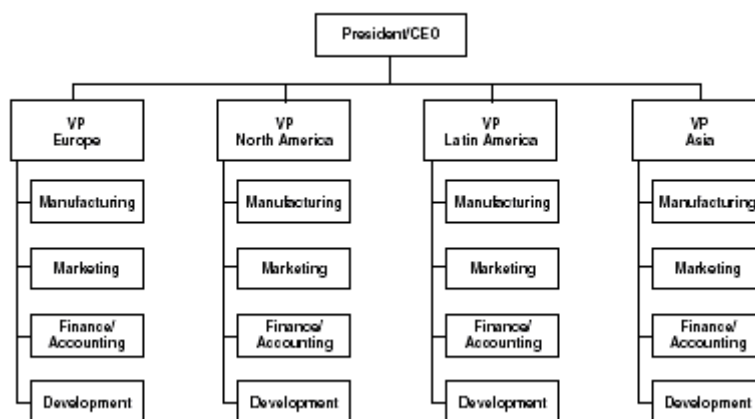


Fig 2.12: Strategic Business Units

2.3 TYPES OF ORGANIZATIONAL STRUCTURE

I. Three main components of organizational structure

A. **Complexity:** degree of differentiation of activities

1. **Horizontal complexity:** number of units across organization

2. **Vertical complexity:** depth of organizational hierarchy

a. **Flat structures:** small number of levels, wide span of control
(# of workers each managers oversees)

b. **Tall structures:** many levels, narrower spans of control

3. **Spatial complexity:** geographical dispersion of physical and human resources

B. **Formalization:** degree of standardization

C. **Centralization:** degree of concentration of decision-making

II. Mechanistic vs. Organic structures

A. Structure types

1. **Mechanistic structure:** high complexity and formalization; centralized decision-making (also, rigid relationships, fixed duties, downward communication, little participation in decision-making)
2. **Organic structure:** low complexity and formalization; decentralized decision-making (also, adaptable duties, flexible relationships, horizontal and upward communication)

B. Factors leading to structure types

Table 2.1 Factors leading to structure types

Factor	Mechanistic	Organic
1. Size	Large	Small
2. Strategy	Cost-minimization, imitation	Innovation, single product line
3. Technology	Mass production, routine tasks, well-defined problems	Unit production, intensive technology (combining services tailored to customer), non-routine tasks, ill-defined problems
4. Environment	Placid-randomized, placid-clustered	Disturbed-reactive, turbulent field

INTRODUCTION TO ORGANIZATIONAL DESIGN

2.4 ORGANIZATIONAL DESIGN

Designing an organization involves choosing an organizational structure that will enable the company to most effectively achieve its goals. Combination of organization design and emergent organizational behavior forms an efficient and resilient organizational-control framework. Emergent organizational behavior is an on-line and primarily bottom-up process in which agents look for interaction and local control decisions that have been effective in the past and give similar decisions preference in the future.

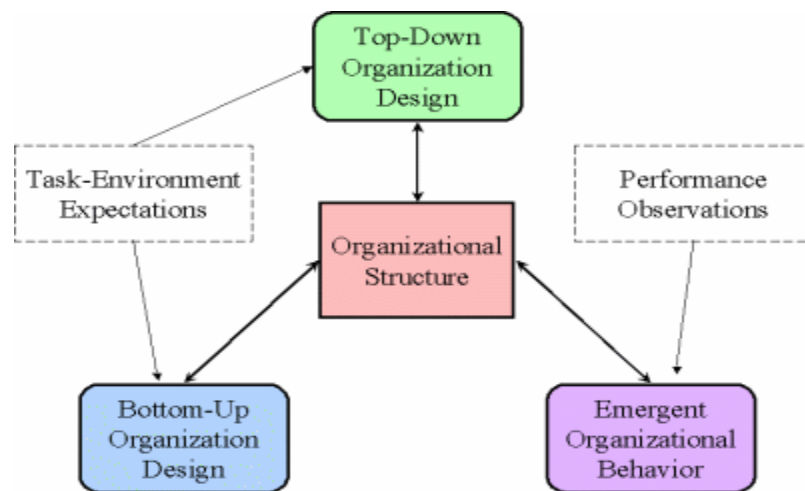


Fig 2.13: Organizational design framework

By representing these preferences explicitly and aggregating them together, an emergent organizational structure can be created. In contrast, designed organizations are created by using organization-design knowledge and task-environment information to develop an explicit organizational structure that is then elaborated by the individual agents into

appropriate behaviors. Coupled together, an initial designed organization can provide ballpark organizational behavior preferences that can be refined in an emergent fashion, and emergent organizational behavior can provide a stimulus for improved organizational design. Significant tension between the designed organization and potential emergent organizational behavior is an indication that the current organizational structure may have become inappropriate and provides important information for organizational restructuring or redesign.

Organization design is the creation of an organization's structure, traditionally functional, divisional, and matrix. In a functional organization, authority is determined by the relationships between group functions and activities. Functional structures group similar or related occupational specialties or processes together under the familiar headings of finance, manufacturing, marketing, accounts receivable, research, surgery, and photo finishing. Economy is achieved through specialization. However, the organization risks losing sight of its overall interests as different departments pursue their own goals.

In a divisional organization, corporate divisions operate as relatively autonomous businesses under the larger corporate umbrella. In a conglomerate organization, divisions may be unrelated. Divisional structures are made up of self-contained strategic business units that each produces a single product. A central headquarters focusing on results, coordinates and controls the activities and provides support services between divisions. Functional departments accomplish division goals. A weakness however, is the tendency to duplicate activities among divisions.

In a matrix organization shown in fig 2.14, teams are formed and team members report to two or more managers. Matrix structures utilize functional and divisional chains of command simultaneously in the same part of the organization. It is used to develop a new product, to ensure the continuing success of a product to which several departments directly contribute and to solve a difficult problem. By superimposing a project structure upon the functional structure, a matrix organization is formed that allows the organization to take advantage of new opportunities. This structure assigns specialists from different functional departments to work on one or more projects being led by project managers. Project managers have authority over activities geared toward achieving organizational goals while functional managers have authority over promotion decisions and

performance reviews. Matrix organizations are particularly appealing to firms that want to speed up the decision-making process. However, the matrix organization may not allow long-term working relationships to develop. Furthermore, using multiple managers for one employee may result in confusion as to manager evaluation and accountability. Thus, the matrix system may elevate the conflict between product and functional interests.

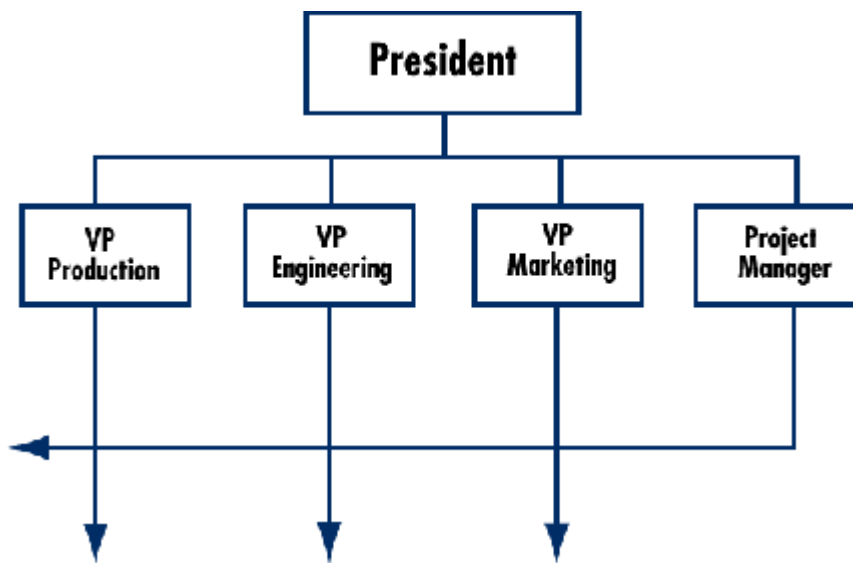


Fig 2.14: Matrix organization

Boundaryless organizations share many of the characteristics of flat organizations, with a strong emphasis on teams. Cross-functional teams dissolve horizontal barriers and enable the organization to respond quickly to environmental changes and to spearhead innovation. Boundaryless organizations shown in fig 2.15, can form relationships (joint ventures, intellectual property, distribution channels, or financial resources) with customers, suppliers, and competitors. A boundaryless environment is required by learning organizations to facilitate team collaboration and the sharing of information. When an organization develops the continuous capacity to adapt and survive in an increasingly competitive environment because all members take an active role in identifying and resolving work-related issues, it has developed a learning culture. A learning organization is one that is able to adapt and respond to change. This design empowers employees because they acquire and share knowledge and apply this learning to decision-making. They are pooling collective intelligence and stimulating creative thought to improve performance. Supervisors facilitate learning by sharing and aligning

the organization's vision for the future and sustaining a sense of community and strong culture.

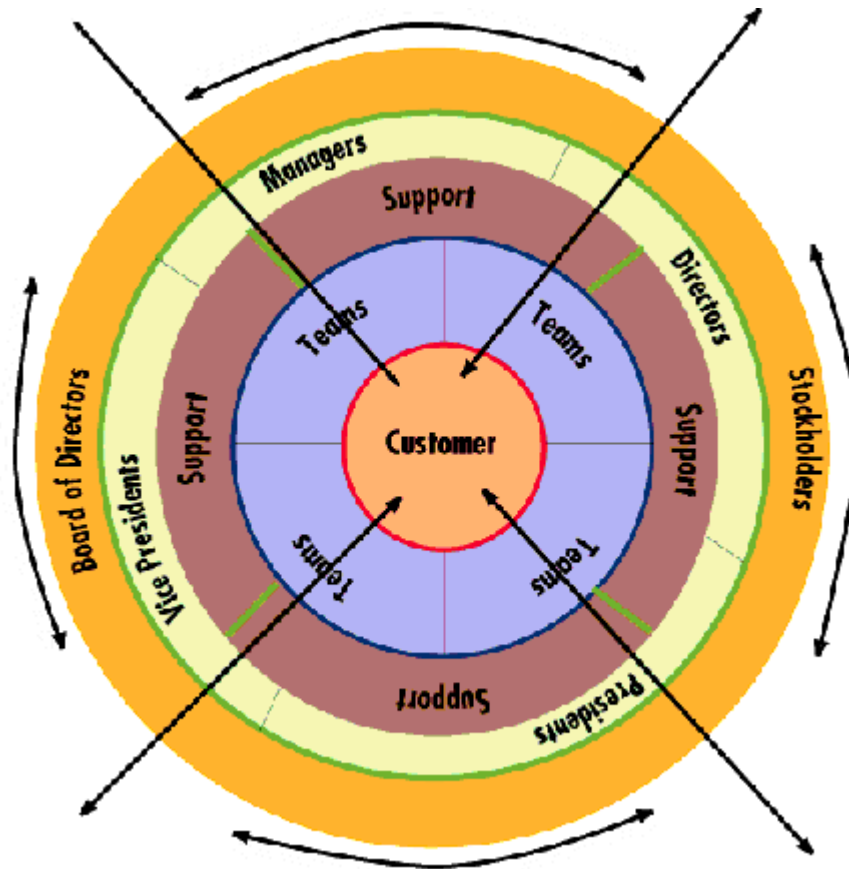


Fig 2.15: Boundary less organization

2.4.1 Organizational Design Types

I. **Functional:** Grouping by task (each group does something different)

A. Advantages

- Allows task specialization and expertise to develop
- Don't have redundancy of functions across groups that occurs in divisional design

B. Disadvantages

- Poor communication across functional areas
- Hard to identify who is responsible for failures, success (for example for poor sales of a product)

II. **Divisional:** Grouping by product, customer, location, topic, etc. (each group does same tasks but for a different topic, customer, product, location, etc.)

A. Advantages

- Coordination within product lines made easier
- More adaptable to changes in environment (e.g., can shut down a division when a product is no longer selling)
- Responsibility for failures, successes identifiable
- Competition across divisions can serve as a motivator

B. Disadvantages

- Redundancy of functions across divisions
- Competition for resources, power
- Lack of development of expertise in functional areas

III. **Hybrid:** Functional at one level, divisional at another level

A. Advantages

- Functional support at top for product groups can eliminate redundancy problem of divisional design and increase expertise available
- Can use functional groupings where need advantages of functional grouping, and divisional groupings where need advantages of using divisional grouping

B. Disadvantages

- Difficulties in coordinating can occur across levels because of different modes of operating
- Power struggles can develop because of non-authority of functional groups at headquarters over product groups below

IV. **Matrix:** Functional and divisional simultaneously (e.g., **cross-functional project teams**)

A. Advantages

- Uses human and physical resources more efficiently

- Increases technical quality and product integrity simultaneously

B. Disadvantage

Requires lots of communication and coordination (e.g., between functional and divisional bosses)

V. New trends in structure

A. Networked structure: Disaggregation of organizations (use of independent contractors, joint ventures, etc.)

1. Advantages:

- Allows organization more flexibility
- Doesn't require as many resources (e.g., employee benefits, office space, financing for ventures, etc.)

2. Disadvantages:

- More difficult to control quality—requires controls, e.g., in contracts
- Increases need to coordinate, communicate effectively

B. Increased use of cross-functional teams (from matrix) in conjunction with other more traditional structures.

SUMMARY

The structural relationships in which people work, holds employee attitudes and behavior in addition to individual and group factors. We mean that the structure has an impact on both attitudes and behavior because it reduces ambiguity for employees and clarifies concerns such as “What I am supposed to do?” “To whom I report?” it shapes their attitudes and facilitates and motivates them to higher levels of performance.

Structure also constraints employees to some extent that it limits and controls what they should do. For an instance, organizations structured around high levels of formalization and specialization, strict adherence to the chain of command, limited delegation of authority, and narrow spans of control give employees little autonomy. Controls in such organization are tight, and behavior will tend to vary within narrow range. In contrast,

organizations that are structured around limited specialization, low formalization, wide spans of control, and the like provide employees greater freedom and, thus will be characterized by greater behavioral diversity.

FOR DISCUSSION

1. All things being equal, which is more efficient, a wide or narrow span of control? Why?
2. What is SBU? When would management use it?
3. What is a matrix structure? When would management use it?
4. Explain briefly about the organizational design types.
5. What is departmentalization? Explain briefly about its types.

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Chapter 3

HUMAN RESOURCE MANAGEMENT

HUMAN RESOURCE MANAGEMENT

SCOPE OF THE COURSE

After reading chapter 3, you should be able to:

- Explain the constraints under which the recruitment process takes place
- Understand steps in selection process

- Understand need for training and development
- Outline the methods of performance appraisal
- Define promotion, separation, and transfer

INTRODUCTION

Human Resource Management (HRM) is the management function deals with recruitment, placement, training and development of organizational members. This is also dealing with performance issues and ensuring your personnel and management practices conform to various regulations. Activities also include managing your approach to employee benefits and compensation, employee records and personnel policies. The HRM function and Human Resource Development (career development, organizational development and so on) have undergone many changes over the past years. In past, large organizations looked to the Personnel Department, mostly to manage the paperwork around hiring and paying people. More recently, organizations consider the HR Department as playing a major role in staffing, training and helping to manage people so that people and the organization are performing at maximum capability in a highly fulfilling manner. In this chapter, two types of Human Resource processes is included for the view of its importance.

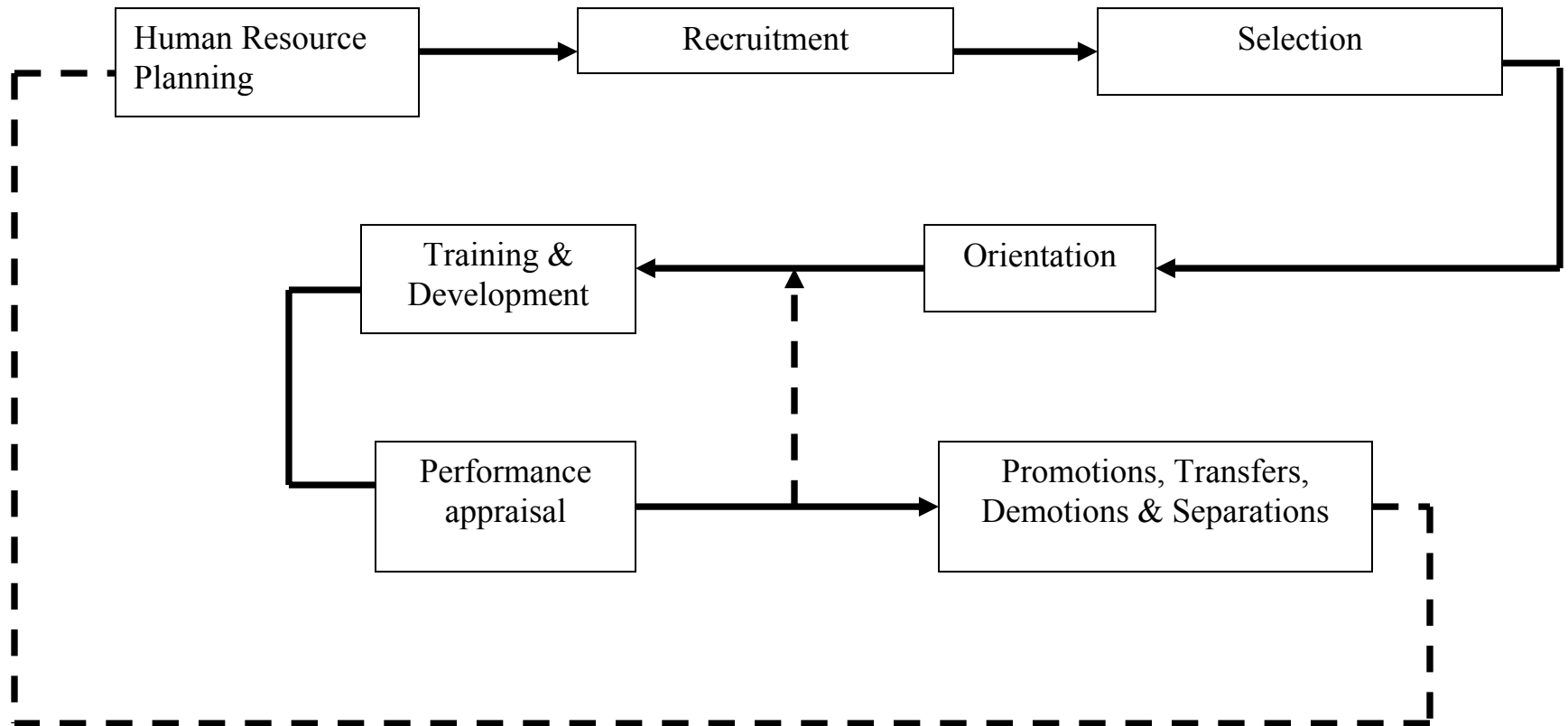
3.1 THE HRM PROCESS

The fig 3.1 shows the HRM process includes the following activities:

1. Human Resource Planning
2. Recruitment
3. Selection

4. Socialization
5. Training and development
6. Performance appraisal
7. Promotions, Transfers and Separations

All the above activities are explained elaborately in the following sections.



Ref: Stoner et.al (2003)

Fig 3.1: The Human Resource Management Process

ASTD MODEL FOR HRM

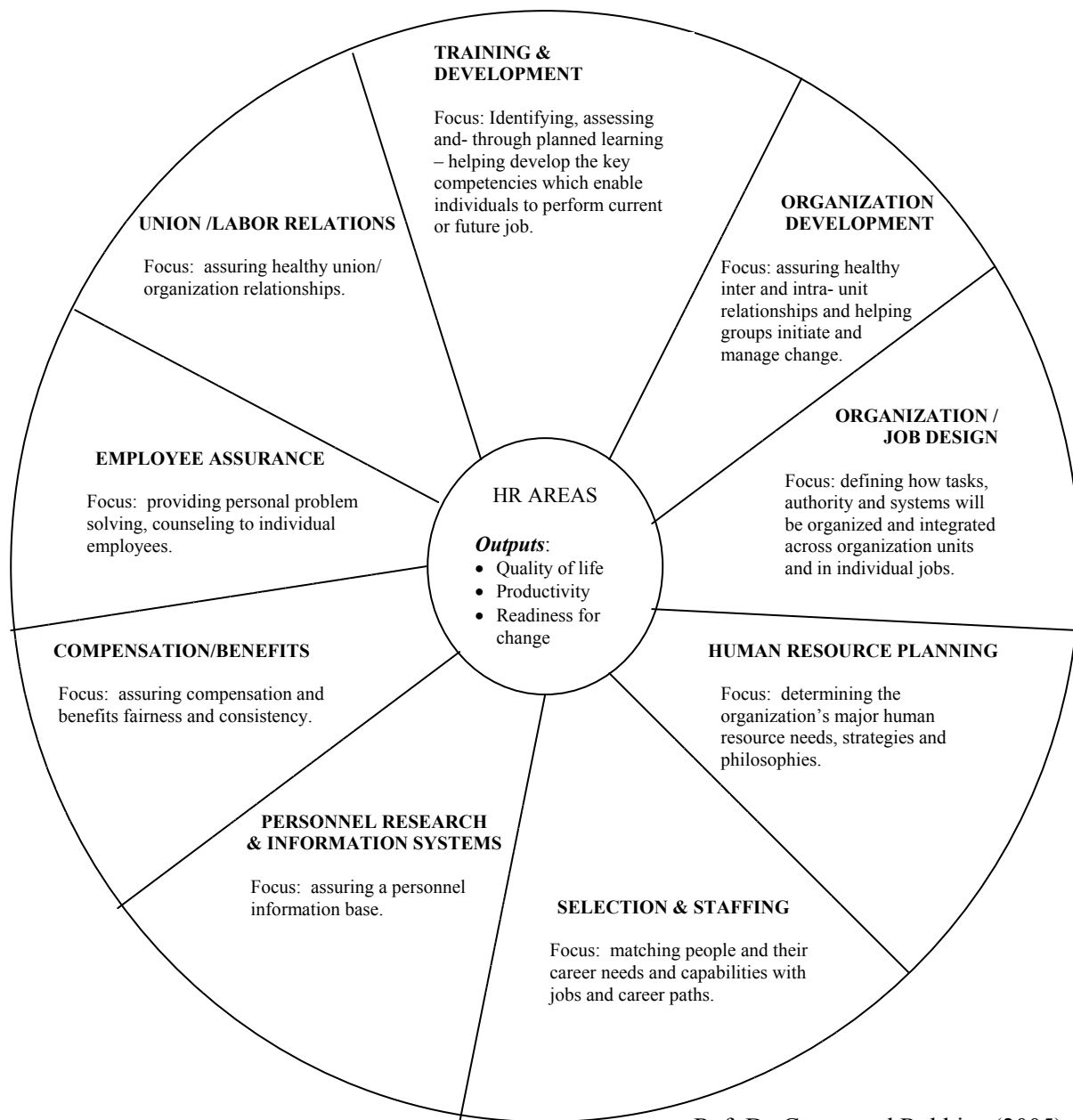
In recent years there has been relative agreement among HRM specialists as to what constitutes the field of HRM. The model shown in fig 3.2 that provided the focus was developed by the American Society for Training and Development (ASTD). In its study, ASTD identified nine human resource areas:

1. Training & Development
2. Organization and Development
3. Organization/ Job Design
4. Human Resource Planning
5. Selection and Staffing
6. Personnel Research and Information systems
7. Compensation/Benefits
8. Employee Assistance
9. Union/Labor Relations

These nine areas have been termed spokes of the wheel in that each area impacts on the human resource outputs: quality of work life, productivity, and readiness for change. Fig is a representation of this model, and the focus of each spoke.

Quality of Work Life

Quality of work life is a multifaceted concept. The premise of quality of work life is having a work environment where an employee's activities become more important. This means implementing procedures or policies that make the work less routine and more rewarding for the employee. These procedures or policies include autonomy, recognition, belonging, progress and development, and external rewards. Autonomy deals with the amount of freedom that employees can exercise in their job. Recognition involves being valued by others in the company. Belonging refers to being part of the organization.



Ref: De Cenzo and Robbins (2005)

Fig 3.2: ASTD Model for HRM

Progress and development refer to the internal rewards available from the organization; challenge, and accomplishment. External rewards in the form of salary and benefits but also include promotion, rank and status.

Productivity

Productivity is the quantity or volume of the major product or service that an organization provides. Many components constitute the productivity factor; we can condense these

components into four categories- capital investment, innovation, learning, and motivation.

Capital investment includes having the best possible machinery available that will help improve the efficiency of the workers. This machinery or equipment can be in many forms –from roots to word processors.

Innovation is a process whereby new and creative ideas are welcomed, studied for their feasibility and if feasible, implemented.

Learning looks at training issues. Not only do we want individuals to work effectively but we want them to be efficient as well. For this, employees must have the proper skills; and in many cases, these skills have to be taught.

Productivity is contingent on an employee's motivation. The best trained employee, one who not only has the ability but has access to the most advanced piece of equipment, will not be productive if he or she is unwilling to be so. Attitude plays an important role as to whether an individual has the propensity to work. Accordingly, to increase productivity we must in part change an employee's attitude or in academic terms, increase his or her morale.

Readiness for change

Change is a fact of life-in both our private and our work lives. At the work site, we must be aware that changes will occur. The change might be subtle, such as getting a new boss. Or it might be a major endeavor, such as an organization installing a computer system for the first time-automating many of the manual operations. But change rarely comes easily for everyone; in some cases it is resisted. To reduce the fear associated with change, training is important. From an organizational perspective, employers must make changes to remain competitive. But it is also their responsibility to communicate the forthcoming changes to their employees, identify why the changes are necessary, and lend their total support in ensuring that the change takes place. Through this process, employers can create a work atmosphere that views change as a positive and progressive endeavor.

3.2 HUMAN RESOURCE PLANNING

Human resource planning is the planning done for the future personnel needs of an organization taking into account both internal factors in the external environment. Internal factors such as current and expected skill needs, vacancies and departmental expansions and reductions are considered. Labor market is considered as the factor in the environment.

3.2.1 Developing a Human Resources Plan

HR plan can serve as information for many purposes such as:

- Identifying HR requirements to better meet business objectives
- Promoting career planning
- Reducing the time and cost of future staffing
- Signaling potential work load and work force adjustment
- Predicting potential shortfalls in the labor force and market availability
- Highlighting retirements and resignations and developing appropriate succession plans
- Identifying seasonal hiring patterns

For making effective planning procedures, some of the basic aspects are required. They are planning for future needs and objective by deciding what skills of people the organization need and by setting departmental strategic objectives for the next year and next three years. The second aspect is planning to balance of future by comparing forecasted supply and future demand. The organization's future supply and demand for employees to meet the business plans involves the functions need to be performed and the current functions evolve in the organization. The structuring the organization also leads to forecast supply through grouping the positions and levels. Type of competencies or qualifications is required, also used to forecast supply. Fig 3.3 shows the steps for effective human resource planning.

The capabilities and capacities of the organization's current workforce mean that there are existing employees who can do the work at this time. At the same time analyzing the

strengths and weaknesses of the existing people is significant. The most important factor is the labor markets in which likely candidates are located to forecast supply.

The third aspect is planning for recruiting and laying off the employees in the organization. This is sometimes called as downsizing or restructuring the organization. HR manager at many companies helps the laid off employees to find new job. And the final aspect is planning to develop HR plan. This is to ensure that the organization has the steady supply of skilled personnel.

3.3 RECRUITMENT

Recruitment is the process whereby a firm attracts or finds capable individuals to apply for employment. Of course, the objective is to find these applicants at the lowest possible cost. This process begins when new recruits are sought and ends when applicants have submitted application forms or resumes. The result is a pool of job-seekers from which the firms can select the most qualified. Smart companies recruit employees they can retain, and retention depends on getting the right people in the right job in the first place.

Before going to recruitment, the job analysis to be done (i.e. an analytical study of the tasks to be performed to determine their essential factors) written into a job description so that the selectors know that the applicants physical and mental characteristics. It is useful to investigate the desirable qualities and attitudes

Selection is buying an employee (the price being the salary multiplied by probable years of service) and bad buys can be very expensive. For that reason some firms use external expert consultants for recruitment and selection. However, the cost of poor selection is such that, even for the ordinary day to day jobs, those who recruit and select should be well trained to judge the suitability of applicants.

3.3.1 Sources of Recruitment

- Internal promotion
- Employment Exchanges
- Agencies for the unemployed
- Advertising (often via agents for specialist posts)

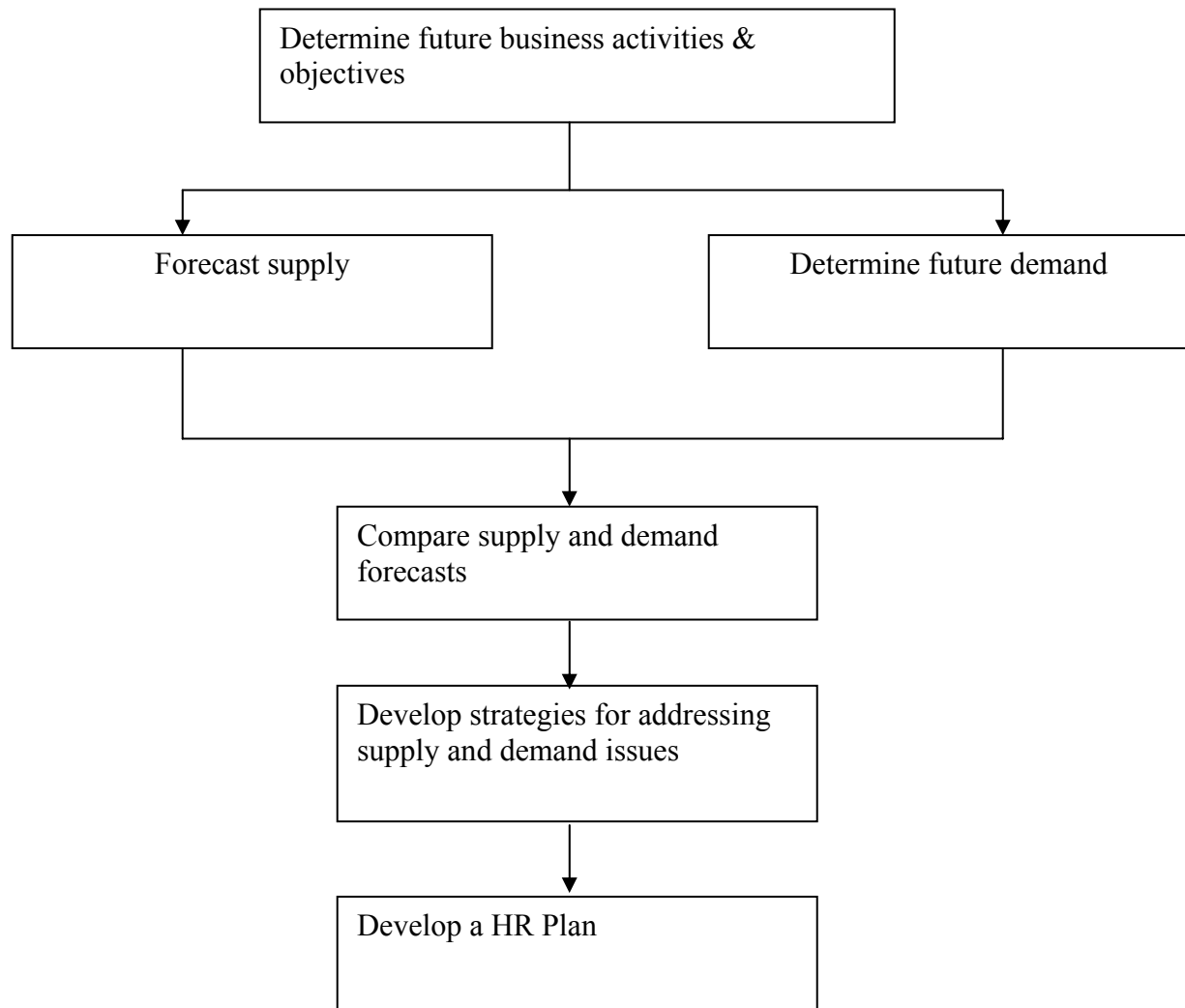


Fig 3.3: Key Steps in Effective HR Planning

The form on which the applicant is to apply (personal appearance, letter of application, completion of a form) will vary according to the posts vacant and numbers to be recruited.

It is very desirable in many jobs that claim about experience and statements about qualifications are thoroughly checked. Before letters of appointment are sent any doubts about medical fitness or capacity should be resolved by requiring applicants to attend a medical examination. For example, in the case of apprentices, the recruitment is for a contractual period or involves the firm in training costs. Interviewing can be carried out by manager or panels of interviewers or in the form of sequential interviews by different

experts and can vary from a five minute 'chat' to a process of several days. Ultimately personal skills in judgment are probably the most important, but techniques to aid judgment include selection testing for: Aptitude test, General intelligence. In more senior posts other techniques are: Leaderless groups, Command exercises and Group problem solving.

Training in interviewing and in appraising candidates is clearly essential to good recruitment. For consistency rating often consists of scoring candidates for experience, knowledge, physical or mental capabilities, intellectual levels, motivation, prospective potential, leadership abilities. These are all according to the needs of the post.

3.3.2 Constraints on Recruitment

Firms seek to recruit give guarantees the number of qualified applicants. However there are often some constraints on the recruitment process. They are:

- Organizational Policies
- Affirmative action Programs
- Recruiter Habits
- Environmental Conditions
- Job Requirements

Organizational Policies

An example of an organizational policy might be a promote from within policy. Such policies are encountered in unionized firms where the collective agreement stipulates that job openings must be posted internally prior to seeking applicants from outside the organization.

Further, in many unionized environments, policies may restrict the number of part-time employees working for the firm. This is clearly a recruitment constraint in so far as it places limitations on the firm. However, it may well also limit the number of applicants because some very highly qualified applicants may simply prefer part-time employment.

Affirmative action Plans

Occasionally, firms may adopt affirmative action policies in an effort to attain a workforce that is more representative of the general public. In efforts to increase workforce diversity, firms may choose to voluntarily hire persons with specific characteristics. More often, such affirmative action policies are mandated by law.

Recruiter Habits

Recruiter habits may also constitute a recruitment constraint. For example, past successes may lead to habits or preferred tendencies in recruitment. One recruiter, who had played cricket, had considerable success recruiting other cricket enthusiasts. Whereas he had luckily an initial success, he may seek out cricket players in his recruitment. Obviously, cricket skills are not necessarily the indicators of job related success. Such recruiter habits do not constitute good recruitment practices.

Environmental Conditions

The rate of unemployment in an area can have an influence on recruitment. High unemployment or surplus of labor supply may result in a larger number of skilled applicants for a particular job. For example firms can take advantage of layoffs in related industries as skilled workers become available. On the other hand, the recruiting activities of competitors can limit the supply of qualified applicants.

Changes in legislation governing the employment of certain classes of employees can also constrain recruitment activities. If the degree of qualification necessary to do a particular job is changed by way of legislation, then the firm's recruitment activities may also need to change.

Job Requirements

Generally, skilled workers are more difficult to find than unskilled workers. A limited pool of potential applicants causes firms to use different recruiting techniques. Whereas an advertisement placed in a newspaper's classified section may serve to attract unskilled workers, recruitment of skilled workers may require more sophisticated techniques.

3.3.3 Internal Recruitment

Should the recruitment process be started from internally or externally? There is nothing inherently better about either internal or external recruitment. However, there are some advantages to internal recruitment.

- Increased morale for employees (one promotion leads to another vacant position and this chain effect contributes further to increased morale)
- Reward good performance or loyalty.
- Human Resource data is immediately available for any employee recruited internally.
- Organization can save money with no orientation sessions because an internal recruit will be familiar with the firm. This employee will be familiar with the firm's products, clients, organizational policies, and corporate culture.

The disadvantages of this recruitment are

- Whereas the firm saves money by eliminating orientation sessions for employees recruited internally, other training costs may go up. If company policies mandate internal recruitment, then employees promoted from within may not have all the requisite skills required for the job. In such cases, employees will have to be trained for their new jobs. This can be a costly process.
- Another unintended negative consequence of internal recruitment might be organizational politics. This may occur when more than one employee aspires to the job vacancy. Those not getting the promotion will be disappointed and may be unwilling to grant the new job-holder the authority required to do the job. Further, the unsuccessful applicants co-workers may also resent the successful candidate.

3.3.4 External Recruitment

The opposite of internal recruitment is external recruitment. The most obvious advantage of external recruitment is the availability of a greater pool of applicants. Thus, only those applicants who have the exact qualifications will apply and be selected. This has consequences for the organization's training budget. Whereas external recruits will require orientation upon being hired, they will not require any extra training.

External recruits also bring new ideas and external contacts to the firm hiring them. Also, if political infighting over a promotion might be a possibility, then external recruitment is one way of eliminating that occurrence.

3.3.5 Internet Recruiting

Finding well-qualified applicants quickly at the lowest possible cost is a primary goal for recruiters. Recent trends indicate that, if you're looking for a job in the technical field or to fill a technical job, you need consider using the Internet. The same may well be true for non technical jobs in the near future.

Advantages

- Internet more cost-effective
- Access to more people and a broader selection of applicants
- Ability to target the type of people needed
- Access to people with a technical background who know computers
- Convenience and Ease of use
- Quicker response

Disadvantages

- Attraction of the passive job seeker, the person who is not actively searching on the Internet
- An increased volume of applicants
- Not everyone has access to or uses the Internet

3.4 SELECTION PROCESS

Selection is the process of making a hire or no hire decision regarding each applicant for a job. The process typically involves determining the characteristics required for effective job performance and then measuring applicants on those characteristics. The characteristics required for effective job performance are typically based on a job analysis.

Recruitment is the process of generating a pool of qualified candidates for a particular job. The firm must announce the job's availability to the market and attract qualified

candidates to apply. The firm may seek applicants from inside the organization, outside the organization or both.

3.4.1 Steps in the selection process

Formal application

The figure 3.4 shows the steps in the selection process. The purpose of the formal application indicates applicants desired position and also provides information for interviews. This process considers the need for the position and examines the possibility of job redesign. Human Resource Manager must make available up-to-date position description of the job. This process finds the deficient applicants who applied for the job.

Interview

Selection committee must be constituted by the HR department before conducting interview. In the selection committee at least one member is trained in Staff Selection. This committee ensures all information relevant to the selection process to be kept confidential and equal opportunity issues are drawn to the attention of members. And all members are involved at all stages of the selection process. The committee also provides feedback system for unsuccessful applicants. The screening interview in this process is conducted for quick evaluation of applicants suitability. In this process selection committee asks questions on their experience and salary expectation. It is also the process of evaluating the qualifications of individuals in an applicant pool against established position qualifications to determine which applicants in the pool meet minimum qualifications.

Testing

Firms should endeavor to act on objective data and this is true for compensation management and performance appraisal and it is certainly true for the selection process where firms wish to assess the match between job applicants and job requirements.

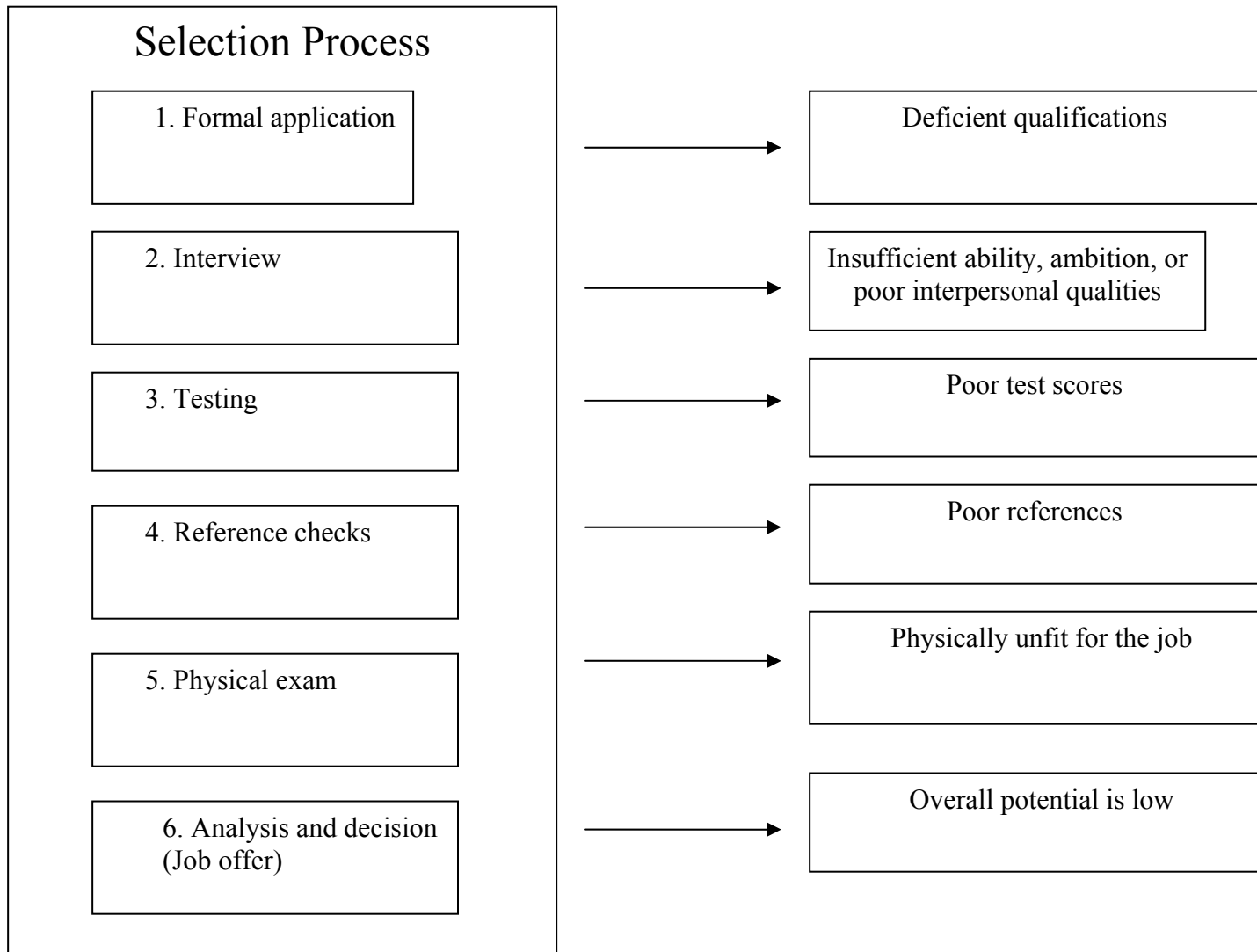


Fig 3.4: Steps in the selection process

A way to ensure that selection decisions are based on objective data used employment tests. Employment tests provide firms with objective data for purposes of comparing applicants. Based on these data, inability or poor interpersonal qualities of applicants are identified. As the employment test score is related to actual performance of job, it is necessary to validate the score. This test bear the resemblance to the job related task a successful applicants must to do.

Reference checks

Reference check is the process of obtaining information from former employers, supervisors, co-workers or others regarding a candidate's work performance or behavior. This information is used by the selection committee along with other information collected during the selection process to determine the candidate's suitability for the advertised position, and ultimately to determine which candidate is best suited for employment. If any applicant had the misbehavior in the former organization, it is possible to account his behavior. This check identifies the kind of the applicant and is the applicant is a reliable worker?

Physical exam

In depth selection interview will be conducted before admitting applicant to physical test.

The following steps should be followed to conduct in depth interview:

- Conduct formal job analyses
- Write accurate job descriptions
- Interviewers review job-relatedness of potential question by consulting appropriate job descriptions
- Interviewers write out all questions before the interviews
- Use panel interviews
- Create rating forms for the interviews
- Anchor interview questions to job behaviors
- Standardize interviews

Physical examination is followed by in depth interview to ensure effective performance of applicant and protect other employees against diseases. Also this is useful to maintain employee's health record and protects firm against unjust worker's compensation claims.

For this purpose many of the company has its own medical doctor.

Analysis and decision (Job offer)

This is the end of the selection process. At this stage, successful (as well as unsuccessful) applicants must be notified of the firm's decision. Since money and effort has been spent on all applicants, the HR department may wish to consider even the unsuccessful applicants for other openings in the organization.

The applications of unsuccessful applicants are often kept on file and the applications of successful applicants will be retained in the employees' personnel files. When a job offer is made, it should include the following information:

- The position offered
- Location of the job
- Salary
- Benefits
- Starting date
- Any papers or information that should be brought on the first day of work
- Date by which the applicant must respond to your job offer, so you can move on to the next candidate if your first choice doesn't accept.

3.5 SOCIALIZATION

Socialization involves orienting new employees in the organization and to the units in which they will be working. It is important that new employees become familiar with the company's policies, procedures, and performance expectations. Socialization can make the difference between a new worker's feeling like an outsider and feeling like a member of the team. Most people are starting a new job with nervous and perhaps concerned about performing up to their employer's expectations. And also their work is being accepted by other employees. A thorough orientation program takes time and effort but will increase worker productivity, decrease confusion, and provide satisfaction for both employer and employee.

Two questions need to be answered in regards to the orientation of a new employee. They are who will orientate the new employee? And what should be covered during orientation? One person should be in charge of handling orientation certainly by the HR people. Having just one individual in charge of orientation ensures a consistent

message to new employees. The orientation of a new employee can involve several people even though one person has overall responsibility.

Information covered will change from organization to organization but a basic core of material should be discussed with the new employee, including such specific characteristics of the organization as layout of operation, other employees, history, mission, goals, and role of the employee. This kind of information provides the big picture of the farm to the employee. Personnel policies including probationary period, disciplinary actions, work schedule, safety rules, and use of equipment also need to be covered.

New employees are always interested in their benefits. Items such as pay, vacation, sick leave, and other benefits should be covered. Discuss specific responsibilities the new employee will be assigned, how the job relates to other work and safety rules. Finally, be sure to introduce the new employee to management team, including family members and other employees. It is helpful to develop an employee handbook so policies and benefits can be accessible and clear to both employer and employee.

Answer all of the immediate questions that the new employee might have. It is important to develop open, two-way lines of communication between the employer and employee right from the beginning. Consider the time spent for orientation as an investment for both you and the employee. The well-defined expectations will pay dividends and reduce possible misunderstandings between employer and employee. By orientating the new employee properly, a smooth transition can be made to train.

3.6 TRAINING AND DEVELOPMENT

Training program is a process designed to maintain or improve current job performance. Development process is a process designed to develop skills necessary for further work activities.

Within an organization training and development is necessary in order to:

- Develop workers to undertake higher-grade tasks;
- Provide the conventional training of new and young workers
- Raise efficiency and standards of performance;
- Meet legislative requirements (e.g. health and safety);
- Inform people (induction training, pre-retirement courses, etc.);

From time to time meet special needs arising from technical, legislative and knowledge need changes. Meeting these needs is achieved through the training loop. The diagnosis of other than conventional needs is complex and often depends upon the intuition or personal experience of managers and needs revealed by deficiencies.

Group training is concerned in addition to formal courses there are:

- Lectures and talks by senior or specialist managers
- Discussion group (conference and meeting) activities
- Briefing by senior staffs
- Role-playing exercises and simulation of actual conditions
- Video and computer teaching activities
- Case studies (and discussion) tests, quizzes, games, observation exercises and inspection and reporting techniques.

Evaluation of the effectiveness of training is done to ensure that it is cost effective, to identify needs to modify or extend what is being provided, to reveal new needs and redefine priorities and most of all to ensure that the objectives of the training are being met.

The latter may not be easy to ascertain where results cannot be measured mathematically. In the case of attitude and behavioral changes sought, leadership abilities, drive and ambition fostered, etc., achievement is a matter of the judgment of senior staffs. Exact validation might be impossible but unless on the whole the judgments are favorable the cooperation of managers in identifying needs, releasing personnel and assisting in training ventures will cease.

3.6.1 Steps in Training

The training process can be broken down into five steps each of these will assist the employer or trainer in understanding this process.

Prepare : The first step in this process is to prepare the learner. The trainer should put the learner at ease and explain why the skill to be learned is important. Explain any hazards or problems that may be involved and how to deal with them. Answer any questions that the learner may have about the task.

Tell : Explain the task thoroughly. Break it down into key parts or steps. Most employees will find that learning several smaller tasks and putting those together is easier than trying to learn one large skill all at once.

Show : Demonstrate for the employee exactly how the task or skill is to be performed. Involve the employee by asking questions and getting feedback. Have the learner explain the process or skill back to the trainer.

Do :The learner now has the opportunity to perform the task. The trainer needs to help the learner develop confidence by at first carefully monitoring the learner, then allowing him/her to work without supervision. The employee needs to make sure that the employee performs each step correctly and avoids developing any bad habits.

Review : Provide honest feedback to the learner in terms of encouragement, constructive criticism and additional comments. This is a great opportunity to praise the employee or correct his/her progress. [Dr. Bernie Erven]

3.6.2 Management Development Programs

On the job methods

Coaching is the training of an employee by his/her immediate superior. The definition of coaching is

“a process that enables learning and development to occur and thus performance to improve. To be a successful a Coach requires a knowledge and understanding of process as well as the variety of styles, skills and techniques that are appropriate to the context in which the coaching takes place” [Eric Parsloe, 1999].

The coach facilitate the exploration of needs, motivations, desires, skills and thought processes to assist the individual in making real, lasting change. He/she use questioning techniques to facilitate subordinate own thought processes in order to identify solutions and actions rather than takes a wholly directive approach. The other functions of coach are

- Support the junior in setting appropriate goals and methods of assessing progress in relation to these goals
- Observe, listen and ask questions to understand the subordinate situation
- Creatively apply tools and techniques which may include one to one training, facilitating, counseling & networking.
- Encourage a commitment to action and the development of lasting personal growth & change.
- Ensure that subordinates develop personal competencies and do not develop unhealthy dependencies on the coaching or mentoring relationship.

- Evaluate the outcomes of the process, using objective measures wherever possible to ensure the relationship is
- Encourage to continually improve competencies and to develop new developmental alliances where necessary to achieve their goals.
- Work within their area of personal competence.
- Possess qualifications and experience in the areas that skills-transfer coaching is offered.
- Manage the relationship to ensure the subordinate receives the appropriate level of service and that programmes are neither too short, nor too long.

Job rotation involves shifting employees from position to position so that they can broaden their experiences and familiarize themselves with various aspects of firm's operations. For an example one day a manager may be working in one part of the factory and the next day he/she may work in a different part. This avoids the employee becoming bored as with job rotation they are doing different jobs all the time and learning new skills. Multi skilling is when people have many skills so they are able to carry out many different jobs. Multi skilling benefits the employer as if they are short of staff in one area, they can move people across.

In *training positions*, trainees are given staff post under a manager as 'assistant to'. This is done because to create a chance to work with senior manager.

In *planned work activities*, trainees are given some assignments to improve their ability and also asked them to participate in an important meeting to get develop skills.

Off the job methods

There are many off the job methods. Two of the most important methods are

Class room instruction: Experts from inside or outside of the organization teach trainee a particular subject. Analyzing case studies, role playing and business games are the part of the class room instruction.

University-sponsored management development programs: This type of programs is conducted from a week to three months or more. All IIMs are conducting such type of programs for managers.

3.7 PERFORMANCE APPRAISAL

Performance appraisal may be defined as a structured formal interaction between a subordinate and supervisor, that usually takes the form of a periodic interview (annual or semi-annual), in which the work performance of the subordinate is examined and discussed, with a view to identifying weaknesses and strengths as well as opportunities for improvement and skills development.

Performance appraisal systems began as simple methods of income justification. That is, appraisal was used to decide whether or not the salary or wage of an individual employee was justified. The process was firmly linked to material outcomes. If an employee's performance was found to be less than ideal, a cut in pay would follow. On the other hand, if their performance was better than the supervisor expected, a pay rise was in order. Little consideration, if any, was given to the developmental possibilities of appraisal. It was felt that a cut in pay, or a rise, should provide the only required impetus for an employee to either improve or continue to perform well. In many organizations - but not all - appraisal results are used, either directly or indirectly, to help determine reward outcomes. That is, the appraisal results are used to identify the better performing employees who should get the majority of available merit pay increases, bonuses, and promotions. These appraisal results are used to identify the poorer performers who may require some form of counseling or in extreme cases, dismissal or decreases in pay.

3.7.1 Basic Purposes

Performance appraisal systems contain two basic systems operating in conjunction.

- *evaluation system*
- *feedback system*

The main aim of the evaluation system is to identify the *performance gap*. This gap is the shortfall that occurs when performance does not meet the standard set by the organization as acceptable. The main aim of the feedback system is to inform the employee about the quality of his or her performance.

3.7.2 Appraisal Methods

The three most common appraisal methods in general use are

- Rating scales

- Essay methods
- MBO methods

3.7.2.1 Rating Scales

The rating scale method offers a high degree of structure for appraisals. Each employee trait or characteristic is rated on a bipolar scale that usually has several points ranging from poor to excellent.

The traits assessed on these scales include employee attributes such as co-operation, communications ability, initiative, punctuality and technical skills. The nature and scope of the traits selected for inclusion is limited only by the imagination of the scale's designer.

The one major provision in selecting traits is that they should be in some way relevant to the appraisee's job. The traits selected by some organizations have been unwise and have resulted in legal action on the grounds of discrimination.

Advantages

The advantage of rating scales are

- Structured and standardized.
- Encourages equality in treatment for all appraisees
- Easy to use and understand.

Disadvantages

The disadvantages of rating scales are

- Irrelevant rating-scale traits of appraises
- Assumption that all the true and best indicators of performance are included and all false and irrelevant indicators are excluded.
- Perceptual Errors

This includes various well-known problems of selective perception as well as problems of perceived meaning. Selective perception is the human tendency to make private and highly subjective assessments of what a person is really like and then seek evidence to support that view. An example is the supervisor who believes that an employee is inherently good (halo effect) and so ignores evidence that might suggest otherwise. Instead of correcting the slackening employee, the supervisor covers for them and may even offer excuses for their

declining performance. On the other hand, a supervisor may have formed the impression that an employee is bad (horns effect). The supervisor becomes unreasonably harsh in their assessment of the employee, and always ready to criticize and undermine them.

- Problems of perceived meaning
This occurs when appraisers do not share the same opinion about the meaning of the selected traits and the language used on the rating scales.
- Rating Errors

3.7.2.2 Essay Method

In the essay method approach, the appraiser prepares a written statement about the employee being appraised. The statement usually concentrates on describing specific strengths and weaknesses in job performance. It also suggests courses of action to remedy the identified problem areas. The statement may be written and edited by the appraiser alone, or it be composed in collaboration with the appraisee.

Advantages

- Less structured than rating scale method.
- Examines relevant attribute of performance.
- freedom of expression

Disadvantages

- Time-consuming
- Difficult to administer.
- Through freedom of expression appraisers can upset and distort.
- Difficult to compare and contrast the results of individuals

3.7.2.3 MBO (Management By Objectives)

MBO methods of performance appraisal are results-oriented ie, they seek to measure employee performance by examining the extent to which predetermined work objectives have been met. Usually the objectives are established jointly by the supervisor and subordinate.

An example of an objective for a Production manager might be: Increase the production volume to 15000 units by 30 November.

Once an objective is agreed, the employee is usually expected to self-audit; that is, to identify the skills needed to achieve the objective. Typically they do not rely on others to locate and specify their strengths and weaknesses. They are expected to monitor their own development and progress.

Advantages

- Concentrates on actual outcomes.
- Employees are judged according to real outcomes and not on their potential for success
- Results can be observed whereas the traits and attributes of must be guessed at or inferred.
- Recognizes the fact that it is difficult to neatly dissect all the complex and varied elements that go to make up employee performance.

Disadvantages

- Leads to unrealistic expectations about what can and cannot be reasonably accomplished.
- Inflexible objectives to survive by the organization.

3.8 Benefits of Appraisal

- Appraisal offers a valuable opportunity to focus on work activities and goals, to identify and correct existing problems and to encourage better future performance. Thus the performance of the whole organization is enhanced.
- Performance appraisal can have a profound effect on levels of employee motivation and satisfaction for better as well as for worse.
- Performance appraisal offers an excellent opportunity perhaps the best that will ever occur - for a supervisor and subordinate to recognize and agree upon individual training and development needs.
- Appraisal data can be used to monitor the success of the organization's recruitment and induction practices.

3.9 PROMOTIONS, TRANSFERS AND SEPARTIONS

The movement of personnel within an organization is their promotion, transfer, demotion and separation. These are the major aspects of human resource management.

3.9.1 PROMOTIONS

Promotion is the shift of an employee from one position to another having more responsible duties or involving more skill (higher classification). To be promoted, the employee must meet the qualification required by the new position. Provisions will be made by each institution to provide opportunities for promotion. Promotions are most significant way to recognize superior performance. So this is to be fair and based on merit and untainted by favoritism. Even if it is fair, it creates a number of problems.

1. Employees who bypassed for promotion feel resentful which may affect their morale and productivity.
2. Discrimination against women, older employees and minority groups in promotion.

3.9.2 TRANSFERS

Transfer is defined as the reassignment of an employee without examination from one position to another position in the same class or to a position in a similar or related class with the same salary range. Transfers are used to give people to broader their job experiences as their part of development. This is mainly done to fill vacancy. Many times inadequately performing employees may be transferred to other jobs simply because a senior manger is reluctant fire them. Some employees are refusing transfers because they do not want to move their families.

3.9.3 SEPARATION

Separation means that a person is leaving active duty, but not necessarily leaving the service entirely.

Resignation:

Employees who voluntarily resign from organization normally expected to give at least one month prior notice. The notice is to be written and should include the specific reason for the resignation as well as the proposed separation date.

Dismiss

Before dismissing an employee, employer must be aware of potential allegation of wrongful dismissal if required, seek legal advice and advise employee of dismissal in private with the help of witness present and provide copies of documentation, if requested (written warnings, company policy and performance appraisals)

Lay off

Lay off is the separation from a permanent position because of lack of work or lack of funds, or because the position has been abolished or reclassified, or because an employee has exhausted all leave privileges after illness or injury.

SUMMARY

Employers usually find advantageously to use internal promotion and transfer to fill vacancies because it rewards employees for past performance and send signal to other employees that their future efforts will pay off. Outside sources for recruitment are especially useful for filling jobs with special qualifications and to acquire individuals with new skills, ideas, and perspectives. Interviews are customarily used in conjunction with application forms, biographical information blanks, references, background investigations, medical examinations, cognitive ability tests, job knowledge tests, and work sample tests. The interviews can be unstructured, wherein the interviewer is free to pursue whatever approach and sequence of topics might seem appropriate.

In addition to provide training needed for effective job performance, employers offer training in such areas as personal growth and wellness. Managers must establish a context for training by deciding where training is needed, how it connects with strategic goals, and how organizational resources can best be used. On-the-job and off-the-job are used to train of non managerial personnel by apprenticeship training and classroom training respectively.

Performance appraisal programs serve many purposes, but in general those purposes can be clustered into two categories: administrative and developmental. The administrative purposes include decisions about who will be promoted, transferred, or

laid off. Developmental decisions include those related to improving and enhancing an individual's capabilities.

FOR DISCUSSION

-
1. What are the advantages and disadvantages of filling openings from internal sources?
 2. Explain briefly about the steps for the selection process.
 3. Personality tests, like other tests used in employee selection, have been under attack for several decades. What are the some of the reasons why applicants find personality tests objectionable? On what basis could their use for selection purposes be justified?
 4. A new employee is likely to be anxious the first two days on the job.
 - a. What are some possible causes of this anxiety?
 - b. How may the anxiety be reduced?
 5. Indicate what training methods you would use for each of the following jobs. Give reasons for your choices.

File clerk, computer operator, pizza maker
 6. What are the major purposes of performance appraisal?
 7. Describe the relationships among performance appraisal and selection, training and development.

SUGGESTED TEXT BOOKS

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1. Stephen P.Robbins, Mary Coulter, (2005), "Management", 5th Edition, Prentice Hall of India.
 2. De Cenzo D and Robbins S.P, "Personnel Human Resource Management" 5th Edition, Prentice Hall of India, New Delhi.
 3. Flippo E, "Personnel Management", 6th Edition, Tata McGraw Hill, New Delhi.
 4. Dessler G, "Human Resource Management", Prentice Hall of India, New Delhi.

Chapter 4

QUALITY MANAGEMENT

QUALITY MANAGEMENT

SCOPE OF THE COURSE

After reading chapter 4, you should be able to:

- Explain Deming's 14 points on quality
- Outline the principles of quality management
- Understand TQM
- Understand benchmarking process
- Understand need of ISO 9000

INTRODUCTION

4.1 Definition

Quality management is the policy and associated procedures, methods and standards required for the control of projects. The purpose of quality management is to increase certainty by reducing the risk of project failure. It also provides the opportunity for continuous improvement.

4.2 Deming's 14 points

Point 1: Create constancy of purpose toward improvement of the product and service so as to become competitive, stay in business and provide jobs.

One management concern must be to deal with running the business on a day-to-day basis and the other must be to look after the future of the business. The latter requires constancy of purpose and dedication to improvement. Top management must spend time to innovate, put resources into research and education, constantly improve the design of the product and service, and put resources into maintenance of equipment, furniture and fixtures.

In this point Deming is thus condemning 'short-termism'.

Point 2: Adopt the new philosophy. We are in a new economic age. We no longer need live with commonly accepted levels of delay, mistake, defective material and defective workmanship.

Deming's new philosophy is simple. The levels of error that could be tolerated yesterday cannot be tolerated today. Deming stresses that only management is in the position to do something about the vast majority of errors and it is management's task to remove the obstacles that prevent the worker from doing the job correctly.

Point 3: Cease dependence on mass inspection; require, instead, statistical evidence that quality is built in.

The problem with mass inspection is that it is an attempt to control the product rather than the process, and in any case, mass inspection is frequently subject to high levels of inaccuracy. In short, it is too late, ineffective and costly.

Point 4: Improve the quality of incoming materials. End the practice of awarding business on the basis of a price alone. Instead, depend on meaningful measures of quality, along with price.

Many of the problems of poor quality and low productivity are due to the poor quality of incoming materials and the low quality of tools and machines.

Point 5: Find the problems; constantly improve the system of production and service. There should be continual reduction of waste and continual improvement of quality in every activity so as to yield a continual rise in productivity and a decrease in costs.

Point 6: Institute modern methods of training and education for all. Modern methods of on-the-job training use control charts to determine whether a worker has been properly trained and is able to perform the job correctly. Statistical methods must be used to discover when training is complete.

Point 7: Institute modern methods of supervision. The emphasis of production supervisors must be to help people to do a better job. Improvement of quality will automatically improve productivity. Management must prepare to take immediate action on response from supervisors concerning problems such as inherited defects, lack of maintenance of machines, poor tools or fuzzy operational definitions.

It is part of a supervisor's job to coach the people that are being supervised.

Point 8: Fear is a barrier to improvement so drive out fear by encouraging effective two-way communication and other mechanisms that will enable 'everybody to be part of change, and to belong to it'. Fear can often be found at all levels in an organisation: fear of change, fear of the fact that it may be necessary to learn a better way of working and fear that their positions might be usurped frequently affect middle and higher management, whilst on the shop-floor, workers can also fear the effects of change on their jobs. The results of fear can be seen in inspection: operators may record incorrectly the results of inspecting their own work for fear of exceeding the quota of allowable defects and inspectors may falsify results to avoid the wrath of their colleagues.

Point 9: 'Break down barriers between departments and staff areas. People in different areas such as research, design, sales, administration and production must work in teams to tackle problems that may be encountered with products or service'.

Barriers result in sub optimisation as each area tries to do what is best for itself rather than co-operating in order to achieve what is good for the organisation as a whole. Deming points out that one clear symptom of sub optimisation is proliferation of paperwork. Quoting studies that show that 14 per cent of freight charges are spent on paperwork.

Point 10: 'Eliminate the use of slogans, posters and exhortations for the work force, demanding zero defects and new levels of productivity without providing methods. Such exhortations only create adversarial relationships; the bulk of the causes of low quality and low productivity belong to the system, and thus lie beyond the power of the work force'.

Although Deming is portrayed by some authors as being against the use of all posters, he does spell out a type of poster that he feels would be useful.

Posters that explain to everyone on the job what the management is doing month by month to (for example) purchase better quality of incoming materials from fewer suppliers, better maintenance, or to provide better training, or statistical aids and better supervision to improve quality and productivity, not by working harder but by working smarter, would be a totally different story, they would boost morale. People would then understand that the management is taking some responsibility for hang-ups and defects. and is trying to remove obstacles?

Point 11: 'Eliminate work standards that prescribe numerical quotas for the work force and numerical goals for people in management. Substitute aids and helpful leadership; use statistical methods for continual improvement of quality and productivity'.

Joiner and Scholtes cite examples that support Deming's argument against such schemes as management by objectives (MBO) and management by results (MBR):

An electronics firm typically ships 30% of its production on the last day of the month. Why? In order to meet the monthly shipment quota. How? By expediting parts from around the country, by moving partially completed instruments ahead of their place in line and, occasionally, by letting quality standards slip.

Another firm sometimes ships incomplete instruments. A service representative then flies around the country installing the missing parts. The shipment quota for the month is met again. Profits, at least on paper, hold firm.

A chemical plant reports it cannot efficiently run at the mandated inventory levels, so it keeps inventories higher until June 30 and December 31 when inventories are

measured. For those days, it depletes the inventories to an acceptable level, perhaps losing two days production as a consequence.

Many managers annually negotiate safe goals and manage to exceed them, just barely. Some managers include on their list of negotiable goals [figures] which were already secretly accomplished prior to the negotiations.

Production which exceeds the standards is stored so it can be pulled out and used another day.

Joiner and Scholtes also cite the following entertaining example, which we suspect might be apocryphal:

It is interesting to note that Management by Control is widely used in the Soviet Union. Typical is this story. Several years ago there was a surplus of large nails and a shortage of small ones. Why? Managers were held accountable for the tons of nails produced. Later the control was changed to the number of nails produced. This led to a shortage of large nails, since the smaller nails gave higher counts. Neave cites an example taken from Deming of what should be done instead of using the types of control based on arbitrary targets which Deming claims do not work:

Christine had a job with an airline, answering the telephone to give information and to make reservations. She had just been told to increase her number of calls to 25 per hour... Deming [suggested] what could be done to improve matters. Christine could classify the type of call (information, reservation, our airline, other airlines, etc.). The times for the various types of calls could be automatically recorded. The processes involved in these various strata could be examined to see if they were stable or not; if not, special causes could be identified and appropriate actions taken. Once the processes were stabilised, data could be analysed to better understand common causes of variation, and then maybe systems (computer information systems, documented information, etc.) could be improved so that Christine could deal with her calls more efficiently and thus satisfy more customers per hour. This approach would be far more effective, and it would not demoralise her or her fellow-workers. This is not now shooting for arbitrary goals, but is shooting instead for continual improvement.

Point 12: Remove the barriers that rob hourly workers, and people in management, of their right to pride of workmanship. This implies, abolition of the annual merit rating (appraisal of performance) and of management by objective. Again, the responsibility of managers, supervisors, foremen must be changed from sheer numbers to quality.

Deming claims that the system of reward used in many organisations is one of the main constraints that prevent them from developing a 'win-win' culture.

Point 13: 'Institute a vigorous programme of education, and encourage self-improvement for everyone. What an organisation needs is not just good people; it needs people that are improving with education. Advances in competitive position will have their roots in knowledge'.

Point 14: Top management's permanent commitment to ever-improving quality and productivity must be clearly defined and a management structure created that will continuously take action to follow the preceding 13 points.

Deming stresses that the emphasis must be on action by top management, not just support.

4.3 The Quality Management Principles

With growing global competition, Quality Management is becoming increasingly important to the leadership and management of all organizations. Quality Management Principles provide understanding of and guidance on the application of Quality Management. By applying following eight Quality Management Principles, organizations will produce benefits for customers, owners, people, suppliers and society at large. The standard could be found at ISO 9000.

Principle 1 - Customer-Focused Organization

Organizations depend on their customers and therefore should understand current and future customer needs, meet customer requirements, and strive to exceed customer expectations.

Principle 2 - Leadership

Leaders establish unity of purpose and direction of organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.

Principle 3 - Involvement of People

People at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit.

Principle 4 - Process Approach

A desired result is achieved more efficiently when related resources and activities are managed as a process.

Principle 5 - System Approach to Management

Identifying, understanding, and managing a system of interrelated processes for a given objective improves the organization's effectiveness and efficiency.

Principle 6 - Continual Improvement

Continual improvement should be a permanent objective of the organization.

Principle 7 - Factual Approach to Decision Making

Effective decisions and actions are based on the analysis of data and information.

Principle 8 - Mutually Beneficial Supplier Relationships

An organization and its suppliers are independent, and a mutually beneficial relationship enhances the ability to create value.

Definition of Quality Management Principle:

“A comprehensive and fundamental rule or belief, for leading and operating an organization, aimed at continually improving performance over the long term by focusing on customers while addressing the needs of all stakeholders”.

4.4 Total Quality Management (TQM)

TQM is a common approach to implementation of the programmes for quality improvement within an organization; the way of managing the organization focused on quality, based on participation from all the members of the organization fulfilling the users' needs and aiming at long term success and well being of all the members of the organization and the social community;

Tools

Tools & Techniques,

Benchmarking

ISO 9000

Quality Function Deployment

Statistical Process Control

4.4.1 What is Benchmarking?

The term benchmarking was originally used by early land surveyors, who used the term to identify a fixed point from which all other measurements are made. In the late 1970's however, it took a broader meaning. Applied to an organization, benchmarking is a process to determine who else does a particular activity the best and emulating what they do to improve performance. A more formal definition is

"simply the systematic process of searching for best practices, innovative ideas and highly effective operating procedures that lead to superior performance."

Businesses such as AT&T, Motorola, Xerox, as well as most major corporations and many smaller ones have embraced benchmarking as standard operating procedure since the mid- to late 1980's. It has a particular significance in technology, where the rapid change of the business climate can leave a company out in the cold. However, governmental and non-profit organizations have begun implementing benchmarking as late as the early 1990's.

The issue of government benchmarking was among many in Vice-President Gore's National Partnership for Reinventing Government Report (NPR). The report states that "federal agencies have been reinventing their operations to become more businesslike, many have been benchmarking against worldclass private sector companies, other organizations, and other federal agencies that have become really good at what they do (2)." This led to the Federal Benchmarking Consortium Study Report in February 1997. It is being used by agencies such as the EPA and NASA, as well as the City of Reno and the Salt Lake City and various other federal, state, and local government agencies to improve their procedures and practices.

Benchmarking is both different and similar in ways to other types of business improvement practices. These practices include total quality management (TQM), reengineering, and performance measurement.

Benchmarking vs. TQM

Total Quality Management, or TQM for short, consists of three main points (3). First, collaboration with suppliers to ensure that the supplies utilized in work processes are well designed and fit for use. Second, taking continuous employee analysis of work processes to improve their functioning and reduce process variation. Third, maintaining close communication with customers to identify and understand what they want and how they define quality.

TQM works by either one of two processes, consultant-oriented TQM or project-oriented TQM. Consultant-oriented TQM typically involves the creation of separate quality control bodies that oversee the implementation of improvement and the control of quality improvement procedures. This process is generally problematic in the public-sector because the TQM bodies exist outside the chain of command, confusing accountability. These bodies often fail to become a part of the hierarchical

structure of government organizations. In project-oriented TQM, some of the shortcomings of consultant-oriented TQM are addressed. This entails including all employees in the process and including their needs as well as the customer's, as well as using established procedures as a foundation instead of implementing new ones.

In general, TQM uses internal methods and the ideas of people within an organization to improve itself from the inside out. This does not include comparing one's organization to that of another, which is critical in benchmarking. However, due to the potential unwillingness of employees to accept ideas without understanding their logic, both TQM and benchmarking require the input of everyone in an organization and a general resistance to change must be overcome.

Benchmarking vs. Reengineering

Another type of method of performance review and improvement is reengineering. Reengineering has been defined as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in contemporary measures of performance, such as cost, quality, service, and speed (4)." This generally involves discarding old practices with completely new ones. The new practices are usually determined from a process that requires a team and consultant to come up with, measure, and convince others to take up new ideas.

Reengineering can be problematic in government because they don't have profits and completely discarding old processes and breaking down barriers between departments run into political, trade union, or other pressures. This sometimes results in the creation of new agencies rather than overhauling old ones. Reengineering is very expensive and prone to failure rates in over fifty percent of cases. It also requires TQM after its successful implementation.

While reengineering is cutting-edge and dramatic, and encourages employees to think big, it is still an internal process. It does not involve the practices of one organization to compare itself to those of another. While benchmarking may result in the use of completely new ideas similar to reengineering, it often is simply improving on existing ones. In addition, after performing reengineering, organizations often turn to TQM, to maintain their success.

Benchmarking vs. Performance Measurement

“Performance Measurement is government's way of determining whether it is providing a quality product at a reasonable cost (5).” In fact, more than half of all U.S. cities collect performance measures of some type (6). Performance measurement is also used in both government and the private sector for reporting to management.

Performance measurement can be used to measure such things as productivity, effectiveness, quality, and timeliness. When performance measures are used extensively and consistently they can be quite effective improving an organization's output. Government agencies used for the following reasons (7):

- Better decision-making: it provides managers with information to perform their management control functions;
- Performance appraisal: it links both individual and organizational performance to aspects of personnel management and motivates public employees;
- Accountability: it fosters responsibility on the part of managers;
- Service delivery: Improvements in public service performance;
- Public participation: clear reporting of performance measures can stimulate the public to take a greater interest in and provide more encouragement for government employees to provide quality services; and
- Improvement of civic discourse: it helps to make public deliberations about service delivery more factual and specific.

What benchmarking does is to use data collected as performance measures and compare it to other organizations that perform those duties or processes. By comparing to other organizations through benchmarking, performance measurement becomes something other than "bean counting". However, since performance measurement is a prerequisite to benchmarking, the two have become intertwined, but they are not the same.

Summary

Table 4.1 Comparison

	TQM	Performance Measurement	Re-engg	Benchmarking
Focus	Internal	Internal	Internal	External
Main Principles	Develop dialogue within a process to improve it through	Take measurements for comparison and improvement	Develop completely new methods for	Compare processes with others who do the same and determine best

	gradual increments		obsolete or failing processes	methods
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These processes can be thought of as the following situation. An organization is seeking improvement. First, it takes performance measures and determines what processes need to be improved. Then, TQM can be employed to improve these processes internally. In addition, an organization may look beyond itself to other organizations for insight, and benchmark. If both TQM and benchmarking are not enough of an improvement, an organization may seek re-engineering, and restructure the whole process. In any case, performance measurement and TQM will need to be employed to insure that the processes developed remain at the proper levels. Finally, the whole process will need to be repeated as new improvements are needed.

4.4.1.2 The History of Benchmarking

Brief History

G.H. Watson outlines the development of benchmarking in five phases (8):

Phase 1	1950-1975	Reverse Engineering
Phase 2	1976-1986	Competitive Benchmarking
Phase 3	1982-1988	Process Benchmarking
Phase 4	1988+	Strategic Benchmarking
Phase 5	1993+	Global Benchmarking

Reverse engineering was tearing things apart, examining them, improving them, and putting them back together. Benchmarking really began in its modern form with the introduction of competitive benchmarking began with Rank Xerox, and its implementation of benchmarking in beginning around 1976. This was followed by process benchmarking which included looking for ideas outside of the direct competition. Strategic benchmarking involves fundamentally changing the business, not just the process (9). Global Benchmarking is the newest and involves comparing your organization on a global scale.

The Xerox Case

In the 1970s, Xerox was the largest manufacturer of copiers in the world. However, Japanese manufacturers were making better copiers, selling them for less, and making

a good profit. This prompted the company to directly compare itself with its direct and best competitors to determine what it could do to increase productivity while decreasing costs.

The results from their benchmarking were astonishing. They found (10):

- Xerox's ratio of indirect to direct staff was twice that of direct competition;
- It had nine times the number of production suppliers;
- Assembly line rejects were in the order of ten times worse;
- Product time to market was twice as long;
- Defects per 100 machines were seven times worse.

However, Xerox's Japanese joint venture, Fuji Xerox, was performing well. The problem was large, and forced some changes.

Over the next five years, Xerox would have to increase productivity 18% to keep up with its competitors. It did this through a strategy known as leadership through quality, which became the foundation of the revival of the company. For example, Xerox benchmarked L.L. Bean, a Maine outdoor sporting goods retailer, because of their excellent warehouse procedures that are now the standard at most companies. It also benchmarked almost 230 performance areas by the time it won the Malcolm Baldrige National Quality award in 1989 (11).

Public Sector Cases

Due to the relative infancy of benchmarking in the public sector, results of many cases are still not fully known. The demand for better for less has many taxpayer wanting a government that acts like a business, and treats them as a paying customer. In an age when everything is available at the click of a mouse or a swipe of a card, no one wants a government full of red tape and long waits.

A couple of early federal examples are the Bureau of the Census and the IRS. The Bureau of Census set up four teams that were each to do a specific task. One team withdrew due to a lack of support from team members. Yet another withdrew because it could not find sponsors. A third team took a very informal approach that proved of little use. Only one team finished, but it proved difficult to even find a room to meet and get all the team members to be there at the same time.

The IRS, however, succeeded in benchmarking its information system. The IRS hired outside consultants. They started by speaking to top IRS executives. Then the executives showed managers examples in benchmarking. The managers then decided

what to benchmark. This was followed by literature review and outside contacts. Finally, using a method similar to Xerox's they benchmarked four areas (12). These included software measurement, picking and packing in form distribution centers, personnel recruitment and retention, and assistance at walk-in taxpayer sites. As a best-in-class performer, the Ogden, Utah site was emulated for its recognized service record. It went so well, that they now require a benchmarking study as part of standard methodology (13).

Successful benchmarking was done by NASA in the early 1990s as well. NASA conducted 47 separate benchmarking studies. They have been so successful that other federal agencies have turned to NASA for help in benchmarking.

Government benchmarking also reached state and municipal levels. States such as Maryland and Oregon benchmark various agencies very well. Municipalities that have benchmarked successfully include Reno, Boston, Salt Lake City, and Indianapolis. Reno, frustrated by traffic accidents, benchmarked survey techniques from Harrah's Casino Hotels. After surveying residents and noting complaints, Reno Police were able to write fewer tickets while lowering the number of accidents by twenty percent (14). As a result, the department's approval soared from forty percent to ninety percent.

Growth and Demand

As mentioned earlier, benchmarking is a standard tool for most private sector companies. However, in the case of government, it is growing very rapidly. Many agencies and organizations nationwide and worldwide are beginning to look at benchmarking as a tool to help them achieve better results for less. This can be much easier in government in some cases because sharing information is "the cheapest and most efficient, effective, and compelling means for improvement performance (15)."

Advantages:

Benchmarking has many advantages which will be discussed in this section. Rank Xerox's experience with benchmarking led them to the following benefits (16):

- Benchmarking brings out the newness and innovative ways of managing operations.
- It is an effective team building tool.
- It has increased general awareness of costs and performance of products and services in relation to those of competitor organizations.

- It brings together all the divisions and helps to develop a common front for facing competition.
- It highlights the importance of employee involvement and, as such, encourages recognition of individual/team efforts.

These illustrate the benefits of competitive benchmarking, which is used in both the business sector and the public sector. Some of the advantages that will be discussed here are team building, comprehensibility, flexibility, creativity, and evolution.

Team Building

Benchmarking cannot be successful without the full involvement of everyone in contact with a project. It creates a united front for an organization and gives those who work within it a common goal to accomplish. It also includes the ideas and concerns of those affected.

Along with good work on such a project comes recognition. As mentioned there are several awards for an organization to receive. Within an organization may be yet more awards for individuals, teams, or agencies that have exemplary performance. This is achieved by setting goals, then meeting, or exceeding them.

Comprehensibility

Unlike some methods, benchmarking is easy to understand. This is due largely to the fact that benchmarking produces a direct comparison to another organization. After determining whom to follow, you study what they do, and emulate it. There is no misunderstanding of the overall goal of being the best.

Flexibility

Benchmarking is flexible and can be interdisciplinary. Benchmarking can be used on almost any organization, public, private, or, non-profit. It can be fitted to a large multinational corporation or a local shop, from a federal agency to the government of a small village.

Identifying the best does not necessarily mean that a competitor has the best solution. It may be a company who just does something well. When Rank Xerox needed to make its shipping better, it relied on L.L. Bean. This sort of out-of-the-box thinking can create new standards rather than emulating someone else's practices.

Creativity

Sometimes an organization might know where their goals are, but the path to meet them is not clear. Furthermore, even if another organization is perceived to be doing something the best, it does not mean it couldn't be done better. After clearly defining goals, however, it can be easier to come up with new, innovative ways of getting there. It could also create new ways of obtaining information or making partnerships, such as Remington, a shotgun shell manufacturer, getting information on how to make shinier shells from Maybelline's lip stick containers.

Evolution

Benchmarking evolves with the consumer and doesn't require a large up-front cost. As things change in the world, so does who is the best. Because benchmarking involves constant reiteration, evaluating and changing, it changes as the market or consumer does. Although benchmarking is constantly in change, it isn't a big price tag up-front. All one needs are office supplies and a list of the best performers to get started.

Disadvantages:

Benchmarking can require a large investment in time, labor, and capital. Costs for a large project can easily reach into the hundreds of thousands of dollars. These can be minimized through careful, thoughtful, and deliberate planning. As Robert Graham of Medrad notes, "Typically, there are expenses related to travel as well as indirect costs associated with employee time devoted to trips and team meetings. With careful planning benchmarking costs can be kept to a minimum (17)."

Size

The size and scope of a benchmarking project is related directly to the cost. An easy way to minimize costs is to take on a stepwise approach. This minimizes the amount of investment and risk taken concurrently.

Dividing Costs

Organizations can pool resources by taking joint benchmarking projects and dividing costs accordingly. This is more easily done in organizations that are not directly competing, such as government agencies. Various organizations have pooled their resources and knowledge into benchmarking groups.

Consultants

Many consultant firms will also aid an organization in a benchmarking project. These organizations have the technical knowledge and experience to more efficiently gather

and interpret data. Careful background research of a consultant must be made to make this process more effective and it comes at a price. However, this does not require hiring additional staff or expanding roles of current staff.

Education and Travel

Benchmarking does require education and travel costs. Once a team is chosen, they often need to be educated on the methods of benchmarking. This is accomplished through workshops, seminars, meetings, and courses. Then, this information must be disseminated to others. When researching organizations, sometimes it is best to see the organization in action and meet with the team that performed and implemented the changes to gain first-hand knowledge of the processes involved.

Communication

One of the most important methods of keeping benchmarking costs low is effective communication. This involves knowing what you need and where your own deficiencies are and sharing information about yourself. Also, informing others inside of your organization of what has been learned through reports, analyses, etc. and its method of implementation involving flowcharts, matrices, schematics, etc. is critical. Clear communication also lets management know how the project is going and its status. This reduces confusion and conflicts among management and the team and among team members themselves.

Process:

Custom Fit

As mentioned earlier, benchmarking is flexible to almost any application. The process of how to go about benchmarking varies as much as organizations themselves and their ideologies do. Processes vary widely by goals, philosophies, industry, cultures, management plan, and organizational structure. This section will explain some of the explicit processes developed by companies that have benchmarked. The most general and best for a first-try at benchmarking is the most general process, which is the Motorola Five-Step Process described later. An experienced benchmarker such as Rank Xerox, use a much more detailed process.

Rank Xerox Process

Rank Xerox revolutionized business thinking with its benchmarking plan. It had a clear goal and determined upper management team. A five-phase, twelve-step process

was developed by Robert C. Camp, Manager of Benchmarking Competency Quality and Customer Satisfaction at Xerox (18):

Xerox Twelve-Step Process

Phase 1: Planning

1. Identify what to benchmark
2. Identify comparative companies
3. Determine data collection method and collect data

Phase 2: Analysis

4. Determine current performance gap
5. Project future performance levels

Phase 3: Integration

6. Communicate findings and gain acceptance
7. Establish functional goals

Phase 4: Action

8. Develop action plans
9. Implement specific actions and monitor progress
10. Recalibrate benchmarks

Phase 5: Maturity

11. Attain leadership position
12. Fully integrate practices into processes

AT&T and Other Processes

Two-time, Baldrige Award winning AT&T, an active benchmarker, has developed a nine-step model (19):

AT&T Nine-Step Process

1. Identify what to benchmark
2. Develop a benchmarking plan
3. Choose data collection method
4. Collect data
5. Choose best-in-class companies
6. Collect data during a site visit
7. Compare processes, identify gaps, and develop recommendations
8. Implement recommendations
9. Recalibrate benchmarks

Other processes have been developed such as the Motorola five-step process and the seven-step process (20).

Motorola Five-Step Process

1. Decide what to benchmark
2. Find companies to benchmark
3. Gather data
4. Analyze data and integrate results into action plans
5. Recalibrate and recycle the process

Seven-Step Process

1. Determine which function(s) to benchmark
2. Identify key performance variable to measure
3. Identify best-in-class companies
4. Measure performance of best-in-class companies
5. Measure your own performance
6. Specify programs and actions to meet and surpass
7. Implement and monitor results

SPI Five Phase Model

The model produced by the Strategic Planning Institute's (SPI) Council on Benchmarking produced the Simple Consensus Model summarizing the five phases of benchmarking in generic terms. This can then be mapped over the above-mentioned processes. These five steps are:

Step Description

- 1 Launch
- 2 Organize
- 3 Reach Out
- 4 Assimilate
- 5 Act

These steps can then be "mapped" onto the Motorola Five-Step Process as follows :

Table 4.2.Motorola Five-Step Process

Description	Launch	Organize	Reach Out	Assimilate	Act
1. Decide what to benchmark	x				
2. Find companies to benchmark		x			

3. Gather the data			x		
4. Analyze data and integrate				x	
5. Recalibrate and recycle the process					x

Readiness

Readiness is determining whether an organization is capable of starting and sustaining a benchmarking process. There are five broad categories for assessing an organization's readiness for best practices. These are (23):

- Benchmarking readiness deals with matching the benchmarking organization and its benchmark partners on various dimensions.
- Culture readiness concerns the readiness of the benchmarking organization and its environment for importing best practice.
- Implementation readiness covers activities that prepare the specific organizational entity and the benchmark practice itself for implementation in the new setting.
- Operation readiness addresses the last and most enduring issues: those that monitor the status and insure the successful ongoing operation of the practice once it is in place
- Technical readiness centers on the technical skills needed to conduct a benchmarking study and to import a best practice.

Various techniques are used to determine whether an organization is ready. This can be accomplished by asking questions or a scoring system.

4.4.2 ISO 9000

ISO 9000 - Benefits and Problems

ISO 9000 has received much publicity. Some managers see it as a prerequisite for conducting business. For others, it substitutes for the difficulties and vagaries of Total Quality Management (TQM). Some see only a needless bureaucratic boondoggle. Depending on the situation, any of these views might be correct.

Sensibly applied, ISO 9000 is a qualifier for international markets or specific domestic customers. Certification can be a valuable marketing tool. The standards are a sound blueprint for a quality system. They can lead the way to the more difficult and sophisticated approaches of Total Quality Management. ISO 9000 can improve a company's cost structure by 5%-20%.

Approached unwisely, ISO 9000 can be costly and unproductive. It may create a quality bureaucracy which adds to the cost structure and slows product development. It can focus people on paperwork instead of customers. It can divert management concentration and energy from more vital issues.

What Is ISO 9000?

The ISO 9000 standards define minimum requirements for business quality assurance systems. These are "consensus standards" promulgated by the International Standards Organization in Europe and the American National Standards Institute (ANSI) in the United States. The ANSI standards are officially titled the "Q90" series. They are identical to the ISO 9000 series and people use the names interchangeably.

Conformance is voluntary. However, many European firms use them as a requirement for suppliers. Within the United States, some firms also use the standards for supplier certification.

ISO 9000 (Q90) is a guideline for selection and use of quality system standards. It provides insight for various situations and conditions as well as definitions and explanations.

ISO 9001 (Q91) defines minimum quality system requirements for design/development, production, installation and servicing. It is the most complete standard. It applies to manufacturing and service businesses engaged in all these activities.

ISO 9002 (Q92) is essentially a subset of 9001. It applies only to production and installation activities.

ISO 9003 (Q93) applies to final inspection and test.

ISO 9004 (Q94) is a guideline for quality system elements. It is like a textbook which describes, explains and recommends.

Requirements

The standards use proven management principles:

- Policy Definition
- Clear Responsibility & Authority
- Appropriate Documentation
- Corrective Action
- Capable People & Equipment
- Adequate Resources

Conformance requires that firms apply these principles to areas which impact quality. It further requires consistent practice which is usually most difficult.

Under section 4.4, for example, ISO 9001 requires that product design projects should be planned, that design input parameters shall be defined and at design completion, the resulting design is confirmed as meeting the input requirements. It requires that the design, as well as any changes, be documented. The standard also requires that design changes be approved by the organization or persons who made the original design.

Experienced product design engineers recognize these requirements as common sense— taken for granted in successful design organizations. Product design disasters can usually be traced to violation of one or more of the above requirements.

Certification

The American Society for Quality Control has organized a Registrar Accreditation Board (RAB). This board oversees the training and activities of assessors and certify conformance. Certification is evidence to customers, potential customers and others that a business meets the standard's requirements.

Assessors typically spend 1-3 days at a site. They examine documents, interview employees and observe processes. They look for evidence to confirm compliance or non-compliance. To obtain certification, a business may contract with an accredited assessor. An important customer may wish to assess as part of their supplier certification. Management may wish a self-assessment for internal evaluation.

Who Should Use ISO?

Any firm whose customers make their buying decisions on quality issues should consider using these standards. Firms whose customers require conformance and certification as a qualifier will need a certificate of conformance from an approved Assessor.

Firms who perceive quality as a marketing tool may obtain certification as part of their marketing strategy.

In markets where quality is not a dominant issue firms may use the standards as a guide, but not attempt certification.

Firms may use the standards for their own suppliers requiring certification as a condition of doing business.

Implementation

An important implementation issue is speed. Most firms require 18 months or longer to achieve certification. Another issue is the current state of quality. Those with severe quality problems may need a maximum effort. Is certification necessary for your firm? Is the need urgent enough for a maximum effort? Or should the standards be used internally for their intrinsic value?

The first step is awareness. Management must convince the organization that conformance is important. People within the organization must know the basics.

Special purpose teams are an effective implementation tactic. They establish procedures and practices for various parts of the organization or for certain requirements of the standard.

An especially important requirement of the standard is ongoing self-assessment. The authors consider self assessment and correction as essential for continuing compliance.

Total Quality Management Fits

Total Quality Management emphasizes leadership, management, worker involvement, low-level responsibility, process control and continuous improvement.

The standard requires clear responsibility and authority. It emphasizes decision procedures, their documentation and implementation. The standards will enhance and complement either TQM or conventional quality systems.

Conformance does not guarantee world-class quality. *An organization can conform and still have a mediocre output quality and a high quality cost.*

Your Competitive Edge?

ISO 9000 can be many things to many organizations. For sound decisions, management should know what it requires and, equally important, *what it does not require*. The implementation should consider each firm's size, markets, and current quality position. A knowledgeable and experienced assessor is vital.

For many firms, ISO 9000 can be part of a competitive edge. It can contribute to marketing, reduce costs, and be a qualifier for certain markets or customers. It is a strong foundation for Total Quality Management and Lean Manufacturing.

SUMMARY

Quality management is the policy and associated procedures, methods and standards required for the control of projects. Deming's basic message is that cause of inefficiency and poor quality is the system, not the people, and it is management's responsibility to correct the system to achieve desired results. Quality Management principles provided understanding of and guidance on the application of Quality Management. By applying eight Quality Management Principles, organizations will produce benefits for customers, owners, people, suppliers and society at large.

Total Quality Management (TQM) is a common approach to implementation of the programmes for quality improvement within an organization; the way of managing the organization focused on quality, based on participation from all the members of the organization fulfilling the users' needs and aiming at long term success. Benchmarking, a tool for TQM, is the systematic process of searching for best practices, innovative ideas and highly effective operating procedures that lead to superior performance.

FOR DISCUSSION

1. What is Quality management?
2. Explain briefly about the Deming's view on Quality management.
3. Briefly explain about Quality management principles.
4. What is TQM?
5. What is Benchmarking? How it differs from TQM, Re-Engineering, and performance measurement?
6. Explain briefly about ISO 9000.

SUGGESTED TEXT BOOKS

1. Joe Cullen and Jack, "Total Quality", IFS.Holingum.
2. Feigenbaum, "Total Quality Control", McGraw Hill
3. Peter J and David A, "Implementing Quality through ISO 9000", Viva Book Pvt Ltd, New Delhi
4. Thomason, "An Introduction to Reliability and Control", Machinery Publishers.
5. Grant and Leavenworth, "Statistical Quality Control", McGraw Hill.
6. Juran J.M and Gryna Jr F.M, "Quality Planning and Analysis, Tata McGraw Hill, New Delhi.

Chapter 5

STRATEGIC PLANNING

STRATEGIC PLANNING

SCOPE OF THE COURSE

After reading chapter 5, you should be able to:

- Explain use of strategic planning
- Outline the steps of strategic planning
- Define strategic management
- Understand chances of increasing strategic plan

INTRODUCTION

The objectives of strategic planning are including understanding the benefits of strategic planning; understanding the products of strategic planning; and learning the keys to successful planning and implementation. Many organizations spend most of their time reacting to unexpected changes instead of anticipating and preparing for them. This is called crisis management. Organizations caught off guard may spend a great deal of time and energy "playing catch up". They use up their energy coping with immediate problems with little energy left to anticipate and prepare for the next challenges. This vicious cycle locks many organizations into a reactive posture.

It does not have to be that way. A sensible alternative is a well tested process called strategic planning which provides a viable alternative to crisis management.

Strategic planning is a step by step process with definite objectives and end products that can be implemented and evaluated. Very simply, it is a process by which we look into the future, paint a picture of that future based on current trends, and influence the forces that will affect us.

Strategic planning looks three to five years ahead. It charts a definite course based on strong indicators of what the business environment will be like in those years.

Indicators include census demographic statistics, economic indicators, government policies, and technological advances. They reveal strong trends regarding changes in lifestyles and the economic and political climates, which are important factors influencing the facilities planning and management industry. Some of these trends are potential opportunities, some potential threats, and some are both. Examining the possibilities and formulating strategies to meet the challenges can help the organization take full advantage of opportunities and minimize threats. In short, we

can take control of the future. We can use our energies and resources more effectively and conduct our business more successfully, despite changes in the environment.

5.1 Why Strategic Planning?

Besides the personal satisfaction of taking charge of the organizations future, strategic planning offers at least five compelling reasons for its use:

- Forces a look into the future and therefore provides an opportunity to influence the future, or assume a proactive posture.

- Provides better awareness of needs and of the facilities related issues and environment.

- Helps define the overall mission of the organization and focuses on the objectives.

- Provides a sense of direction, continuity, and effective staffing and leadership.

- Plugs everyone into the system and provides standards of accountability for people, programs, and allocated resources.

In summary, strategic planning is the key to helping us collectively and cooperatively gain control of the future and the destiny of our organization.

5.2 Five Products of Strategic Planning

The overall goal of strategic planning is to produce a workable plan. Along the way, we will develop, evaluate, and refine these five products:

Environmental issues and trends: Factors that may impact the organization and the way it conducts business. Internal issues include staff, services, skills, resources, and needs. External factors include such things as threats of outsourcing. A strategic planning committee compiles an environmental scan, a body of information about the environment. Broad issues, singled out as potentially having significant effect on the facilities planning and management industry, are referred to as mega issues.

Needs Survey: Provides information from clients and peer institutions. The prioritized needs and expectations resulting from the survey are crucial as a basis for setting objectives.

Mission Statement: Defines the organization's fundamental reason for existence and establishes the scope of its business.

General Objectives: Broadly describe the results of what the organization wants to achieve in light of needs and relevant issues.

Strategies: Specific, measurable actions and directions designed to reach the objectives established. Strategies are fulfilled through creation, continuation, change, or elimination of programs.

The mission statement, general objectives, and strategies are the meat of the plan. The issues and results of the needs survey are the input into the plan, and they provide the basic assumptions for developing a realistic and feasible plan.

5.3 Keys to Successful Implementation

Suppose our organization thoroughly develops all five products of strategic planning, completes the process, and comes up with a strategic plan. Everyone has the best intentions but when we get back to our units, we are overwhelmed with daily details. Soon it's "business as usual," the plan sits on the shelf, and before we know it, another year has passed. However, this need not happen.

The three major keys to successful strategic planning and implementation are commitment, credibility, and communication.

Up-front commitment by the leaders must include an adherence to the full and thorough process of strategic planning. There must also be a commitment to implementing the strategies recommended by the strategic planning committee. The leaders should implement programs and services and commit allocations to meet the objectives of the strategic plan at a level that is "doable" for the organization and level of activity. As one person has put it, "To commit to plan, is to commit to change." A strategic planning committee researches, collects input, and makes recommendations. But, it is up to member of the organization to implement the recommendations.

Credibility is created and maintained by following these three guidelines: representative participation, adherence to the complete process, and clear documentation. The strategic planning committee should have representatives from all areas of the organization and adhere to the steps of the process. While the actual logistics of research and implementing the plan can be tailored to the available resources, all five products should be carefully developed and evaluated.

The committee should document all of its research and activities to serve as the basis for the strategic plan and its background materials. It will also serve as a clear record of the committee's activities open for all to see and evaluate. There should be nothing exclusive or secret about strategic planning. It should be open to all for review and input.

Input, feedback, and understanding are crucial at every step. A key concept to remember is that strategic planning is a cooperative and participatory process. Everyone should have input and, ideally, everyone should feel a sense of ownership over the final plan. Such personal commitment will facilitate the implementation process.

It is important to explain the principles and goals of strategic planning to everyone in the organization. We need to assure each person that although he or she may not be on the committee, everyone can have input and evaluate the recommendations. It is up to the staff and committees to determine how to fulfill each objective. The strategic planning committee makes general recommends on what they think should be done. The leadership, operating committees, and staff determine how it will be done.

An additional aid to implement the strategic plan is to create an integrated system by which the strategic plan becomes the "benchmark" (measuring stick) for progress in our organization. It then becomes a system of accountability. The best way to set up an integrated system is for the directors to accept the strategic plan and make the mission statement part of the directives. The strategic plan can then become the context from which programs and services flow. Strategic planning is the key to assuring that our organization is prepared for the challenges of tomorrow.

5.4 Basic steps in a strategic planning process

Strategic Planning Model

Many books and articles describe how best to do strategic planning, and many go to much greater lengths than this planning response sheet, but our purpose here is to present the fundamental steps that must be taken in the strategic planning process. Below is a brief description of the five steps in the process. These steps are a recommendation, but not the only recipe for creating a strategic plan; other sources may recommend entirely different steps or variations of these steps. However, the steps outlined below describe the basic work that needs to be done and the typical products of the process. Thoughtful and creative planners will add spice to the mix or elegance to the presentation in order to develop a strategic plan that best suits their organization!

Step One - Getting Ready

To get ready for strategic planning, an organization must first assess if it is ready. While a number of issues must be addressed in assessing readiness, the determination

essentially comes down to whether an organization's leaders are truly committed to the effort, and whether they are able to devote the necessary attention to the "big picture". For example, if a funding crisis looms, the founder is about to depart, or the environment is turbulent, then it does not make sense to take time out for strategic planning effort at that time. An organization that determines it is indeed ready to begin strategic planning must perform five tasks to pave the way for an organized process:

- Identify specific issues or choices that the planning process should address
- Clarify roles (who does what in the process)
- Create a Planning Committee
- Develop an organizational profile
- Identify the information that must be collected to help make sound decisions.

The product developed at the end of the Step One is a Workplan.

Step Two - Articulating Mission and Vision

A mission statement is like an introductory paragraph: it lets the reader know where the writer is going, and it also shows that the writer knows where he or she is going. Likewise, a mission statement must communicate the essence of an organization to the reader. An organization's ability to articulate its mission indicates its focus and purposefulness. A mission statement typically describes an organization in terms of its:

Purpose - why the organization exists, and what it seeks to accomplish

Business - the main method or activity through which the organization tries to fulfill this purpose

Values - the principles or beliefs that guide an organization's members as they pursue the organization's purpose

Whereas the mission statement summarizes the what, how, and why of an organization's work, a vision statement presents an image of what success will look like. For example, the mission statement of the Support Centers of America is as follows:

The mission of the Support Centers of America is to increase the effectiveness of the nonprofit sector by providing management consulting, training and research. Our guiding principles are: promote client independence, expand cultural proficiency, collaborate with others, ensure our own competence, act as one organization.

We envision an ever increasing global movement to restore and revitalize the quality of life in local communities. The Support Centers of America will be a recognized contributor and leader in that movement.

With mission and vision statements in hand, an organization has taken an important step towards creating a shared, coherent idea of what it is strategically planning for. At the end of Step Two, a draft mission statement and a draft vision statement is developed.

Step Three - Assessing the Situation

Once an organization has committed to why it exists and what it does, it must take a clear-eyed look at its current situation. Remember, that part of strategic planning, thinking, and management is an awareness of resources and an eye to the future environment, so that an organization can successfully respond to changes in the environment. Situation assessment, therefore, means obtaining current information about the organization's strengths, weaknesses, and performance - information that will highlight the critical issues that the organization faces and that its strategic plan must address. These could include a variety of primary concerns, such as funding issues, new program opportunities, changing regulations or changing needs in the client population, and so on. The point is to choose the most important issues to address. The Planning Committee should agree on no more than five to ten critical issues around which to organize the strategic plan. The products of Step Three include: a data base of quality information that can be used to make decisions; and a list of critical issues which demand a response from the organization - the most important issues the organization needs to deal with.

Step Four - Developing Strategies, Goals, and Objectives

Once an organization's mission has been affirmed and its critical issues identified, it is time to figure out what to do about them: the broad approaches to be taken (strategies), and the general and specific results to be sought (the goals and objectives). Strategies, goals, and objectives may come from individual inspiration, group discussion, formal decision-making techniques, and so on - but the bottom line is that, in the end, the leadership agrees on how to address the critical issues.

This can take considerable time and flexibility: discussions at this stage frequently will require additional information or a reevaluation of conclusions reached during the situation assessment. It is even possible that new insights will emerge which change the thrust of the mission statement. It is important that planners are not afraid to go back to an earlier step in the process and take advantage of available information to create the best possible plan.

The product of Step Four is an outline of the organization's strategic directions - the general strategies, long-range goals, and specific objectives of its response to critical issues.

Step Five - Completing the Written Plan

The mission has been articulated, the critical issues identified, and the goals and strategies agreed upon. This step essentially involves putting all that down on paper. Usually one member of the Planning Committee, the executive director, or even a planning consultant will draft a final planning document and submit it for review to all key decision makers (usually the board and senior staff). This is also the time to consult with senior staff to determine whether the document can be translated into operating plans (the subsequent detailed action plans for accomplishing the goals proposed by the strategic plan) and to ensure that the plan answers key questions about priorities and directions in sufficient detail to serve as a guide. Revisions should not be dragged out for months, but action should be taken to answer any important questions that are raised at this step. It would certainly be a mistake to bury conflict at this step just to wrap up the process more quickly, because the conflict, if serious, will inevitably undermine the potency of the strategic directions chosen by the planning committee.

5.5 Standard Format for a Strategic Plan

A strategic plan is simply a document that summarizes, in about ten pages of written text, why an organization exists, what it is trying to accomplish, and how it will go about doing so. Its "audience" is anyone who wants to know the organization's most important ideas, issues, and priorities: board members, staff, volunteers, clients, funders, peers at other organizations, the press, and the public. It is a document that should offer edification and guidance - so, the more concise and ordered the document, the greater the likelihood that it will be useful, that it will be used, and that

it will be helpful in guiding the operations of the organization. Below is an example of a common format for strategic plans, as well as brief descriptions of each component listed, which might help writers as they begin trying to organize their thoughts and their material. This is just an example, however, not the one and only way to go about this task. The point of the document is to allow the best possible explanation of the organization's plan for the future, and the format should serve the message.

The final document should include a table of contents. These are the sections commonly included in a strategic plan:

I. Introduction by the President of the Board

A cover letter from the president of the organization's board of directors introduces the plan to readers. The letter gives a "stamp of approval" to the plan and demonstrates that the organization has achieved a critical level of internal agreement. (This introduction is often combined with the Executive Summary below.)

II. Executive Summary

In one to two pages, this section should summarize the strategic plan: it should reference the mission and vision; highlight the long-range goals (what the organization is seeking to accomplish); and perhaps note the process for developing the plan, as well as thank participants involved in the process. From this summary, readers should understand what is most important about the organization.

III. Mission and Vision Statements

These statements can stand alone without any introductory text, because essentially they introduce and define themselves.

IV. Organization Profile and History

In one or two pages, the reader should learn the story of the organization (key events, triumphs, and changes over time) so that he or she can understand its historical context (just as the planning committee needed to at the beginning of the planning process).

V. Critical Issues and Strategies

Sometimes organizations omit this section, choosing instead to "cut to the chase" and simply present goals and objectives. However, the advantage of including this section is that it makes explicit the strategic thinking behind the plan. Board and staff leaders may refer to this document to check their assumptions, and external readers will better

understand the organization's point of view. The section may be presented as a brief outline of ideas or as a narrative that covers several pages.

VI. Program Goals and Objectives

In many ways the program goals and objectives are the heart of the strategic plan. Mission and vision answer the big questions about why the organization exists and how it seeks to benefit society, but the goals and objectives are the plan of action - what the organization intends to "do" over the next few years. As such, this section should serve as a useful guide for operational planning and a reference for evaluation. For clarity of presentation, it makes sense to group the goals and objectives by program unit if the organization has only a few programs; if some programs are organized into larger program groups (e.g., Case Management Program in the Direct Services Program Group), the goals and objectives will be delineated at both the group level and the individual program level.

VII. Management Goals and Objectives

In this section the management functions are separated from the program functions to emphasize the distinction between service goals and organization development goals. This gives the reader a clearer understanding both of the difference and the relationship between the two sets of objectives, and enhances the "guiding" function of the plan.

VIII. Appendices

The reason to include any appendices is to provide needed documentation for interested readers. Perhaps no appendices are truly necessary (many organizations opt for brevity). They should be included only if they will truly enhance readers' understanding of the plan, not just burden them with more data or complicating factors.

5.6 Increasing chances of implementing our strategic plan

Organizations and their leadership are often reluctant to commit time and resources to a planning process because of the fear of the plan "ending up on the shelf." This article addresses a key question regarding the strategic plan: What can I do to ensure the plan does not end up on the shelf? There are three areas that must be addressed to ensure that the planning process and resulting strategic plan are valuable and useful for the organization:

The process that is used to develop the plan can guarantee success or failure. Credibility and ease of use are often direct results of how the plan was created. The format of the plan will influence how and when people use the document in the workplace. Complex, outdated documents are doomed to remain on the shelf.

Management's use and respect for the plan influences the acceptance for the rest of the staff and board members. There is no reason for program directors to refer to established goals and objectives if the executive director does not.

Ensuring the Plan Has Impact

During the strategic planning process, it is important to include the following process, content, and usage elements to ensure the usefulness of the strategic plan to the organization.

Process Elements

Engage leadership

Include the informal and formal organizational leaders when conducting a process. Active involvement communicates a message of organizational importance and priority.

Work from a common understanding

Provide training on the process and establish a list of expectations and results to ensure that everyone is working towards the same outcomes.

Include individuals who will implement plan

Encourage all levels of staff to contribute to the process. Involving these individuals will ensure that the plan is realistic and help motivate staff to implement the plan.

Address critical issues for the organization

Failure or unwillingness to put these critical issues on the table for discussion and resolution might lead staff to implicitly or explicitly challenge the credibility of the plan, its priorities, and/or its leadership.

Agree on how the plan will be operationalized

Specify who will implement which parts of the plan, scheduling routine evaluation meetings to review progress.

Content Elements

Include an internal and external focus

Remember to address structural, board/staff development, and communication issues in your plan.

Do not get too detailed

Use the strategic plan to articulate the broad framework, direction and, priorities of the organization and its programs. Extremely specific plans become quickly outdated and end up on the shelf.

Create a balance between the dream and reality

Ensure that your plan is grounded in the reality of what can and cannot be accomplished.

Keep language, concepts and format simple

Make sure that the language is easy to understand, especially for those that are unfamiliar with your organization. Structure the document so that it is user friendly.

Usage Elements**Actively use the plan as a management tool**

Actively using the plan for short-term guidance and decision making will establish a model for use.

Incorporate sections of the plan in everyday management

Formalize the usage of the plan into the day-to-day activities of the organization. For example, one organization reads the mission statement at the opening of every business meeting to remind the membership of the organization's focus and purpose. In another organization, the executive director requires that all ideas for program changes or expansion directly address how the changes relate to the organization's mission.

Organize the work of the organization in the context of the plan

Establish operational goals and activities within the context of the strategic plan (e.g., include goals and objectives in individual and program evaluations or have program directors refer to the plan to provide guidance in decision making).

Design a system for controlling the process

Ensure that there are mechanisms (e.g., evaluation meetings, monthly reports against plan) to inform management on progress.

By employing the strategies listed above, you can be sure that the effort you put into the strategic planning process will direct your organization and become a useful tool to both management and staff.

SUMMARY

Strategic planning is a step by step process with definite objectives and end products that can be implemented and evaluated. Very simply, it is a process by which we look into the future, paint a picture of that future based on current trends, and influence the forces that will affect us. Environmental issues and trends, needs Survey, mission Statement, general Objectives, and strategies are the five products of Strategic planning.

FOR DISCUSSION

1. What is strategic planning?
2. What is strategic management?
3. Explain about the products of strategic planning briefly.
4. What are the keys of effective implementation of strategic planning?
5. Explain the steps of strategic planning process.

SUGGESTED TEXT BOOKS

1. Johnson G and Scholes Knowledge, “Exploring Corporate Strategy: Text and Cases”, 3rd Edition, Prentice Hall.
2. Bontje J, “How to create a plan for successful business growth”, Amacom, New York, 1990.
3. Dyson R.G, “Strategic Planning: Models and Analytical Techniques”, Wiley, 1990.

4. Hamel G and Prahalad C, “Competing for the future”, Harvard Business School Press, 1995.

Chapter 6

MARKETING MANAGEMENT

MARKETING MANAGEMENT

SCOPE OF THE COURSE

After reading chapter 6, you should be able to:

- Define marketing and marketing management
- Explain the marketing management orientations
- Understand market segmentation
- Distinguish the types of product

INTRODUCTION

Today's successful companies at all levels have one thing in common: they are strongly customer focused and heavily committed to marketing. These companies share a passion for understanding and satisfying the needs of customers in well-defined target markets. They motivate everyone in the organization to help build lasting customer relationships through superior customer value and satisfaction.

6.1 WHAT IS MARKETING?

Marketing, more than any other business function, deals with customers. Building customer relationships based on customer value and satisfaction is at the very heart of modern marketing. Although we will soon explore more detailed definitions of marketing, perhaps the simplest definition is this one: Marketing is managing profitable customer relationships. The twofold goal of marketing is to attract new customers by promising superior value and to keep and grow current customers by delivering satisfaction.

Sound marketing is critical to the success of every organization—large or small, for-profit or not-for-profit, domestic or global.

You already know a lot about marketing—it's all around you. You see the results of marketing in the abundance of products in your nearby shopping mall. You see marketing in the advertisements on your TV, in your magazines, stuff in your mailbox. At home, at school, where you work, and where you play, you see marketing in almost everything you do. Yet, there is much more to marketing than meets the consumer's casual eye. Behind it all is a massive network of people and activities competing for your attention and purchases.

In this chapter, we begin by defining marketing and its core concepts.

6.1.1 Marketing Defined

What does the term *marketing* mean? Many people think of marketing only as selling and advertising. And no wonder—every day we are bombarded with television commercials, newspaper ads, direct-mail offers, sales calls, and Internet pitches. However, selling and advertising are only the tip of the marketing iceberg. Although they are important, they are only two of many marketing functions and are often not the most important ones.

Today, marketing must be understood not in the old sense of making a sale—"telling and selling"—but in the new sense of *satisfying customer needs*. If the marketer does a good job of understanding consumer needs, develops products that provide superior value, and prices, distributes, and promotes them effectively, these products will sell very easily. Thus, selling and advertising are only part of a larger "marketing mix"—a set of marketing tools that work together to affect the marketplace. We define **marketing** as a social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others. To explain this definition, we will examine the following important core marketing concepts: *needs, wants, and demands; marketing offers (products, services, and experiences); value and satisfaction; exchanges, transactions, and relationships;* and *markets*. Figure 1.1 shows that these core marketing concepts are linked, with each concept building on the one before it.

6.1.2 Needs, Wants, and Demands

The most basic concept underlying marketing is that of human needs. Human **needs** are states of felt deprivation. They include basic *physical* needs for food, clothing, warmth, and safety; *social* needs for belonging and affection; and *individual* needs for knowledge and self-expression. These needs were not created by marketers; they are a basic part of the human makeup.

Wants are the form human needs take as they are shaped by culture and individual personality. An American *needs* food but *wants* Big Mac, french fries, and a soft drink. A person in Mauritius *needs* food but *wants* a mango, rice, lentils, and beans. Wants are shaped by one's society and are described in terms of objects that will satisfy needs. When backed by buying power, wants become **demands**. Given

their wants and resources, people demand products with benefits that add up to the most value and satisfaction.

Outstanding marketing companies go to great lengths to learn about and understand their customers' needs, wants, and demands. They conduct consumer research and analyze mountains of customer sales, warranty, and service data. Their people at all levels—including top management— stay close to customers.

6.1.3 Marketing Offers—Products, Services, and Experiences

Companies address needs by putting forth a *value proposition*, a set of benefits that they promise to consumers to satisfy their needs. The value proposition is fulfilled through a **marketing offer**—some combination of products, services, information, or experiences offered to a market to satisfy a need or want. Marketing offers are not limited to physical *products*. In addition to tangible products, marketing offers include *services*, activities or benefits offered for sale that are essentially intangible and do not result in the ownership of anything. Examples include banking, airline, hotel, tax preparation, and home repair services. More broadly, marketing offers also include other entities, such as *persons, places, organizations, information, and ideas*. Many sellers make the mistake of paying more attention to the specific products they offer than to the benefits and experiences produced by these products. They see themselves as selling a product rather than providing a solution to a need.

A manufacturer of quarter-inch drill bits may think that the customer needs a drill bit. But what the customer *really* needs is a quarter-inch hole. These sellers may suffer from "marketing myopia." They are so taken with their products that they focus only on existing wants and lose sight of underlying customer needs. They forget that a product is only a tool to solve a consumer problem. These sellers will have trouble if a new product comes along that serves the customer's need better or less expensively. The customer with the same need will *want the* new product.

Thus, smart marketers look beyond the attributes of the products and services they sell. They create brand *meaning* and brand *experiences* for consumers.

Value and Satisfaction

Consumers usually face a broad array of products and services that might satisfy a given need. How do they choose among these many marketing offers?

Consumers make choices based on their perceptions of the value and satisfaction that various products and services deliver.

Customer value is the difference between the values the customer gains from owning and using a product and the costs of obtaining the product. Customers form expectations about the value of various marketing offers and buy accordingly. How do buyers form their expectations? Customer expectations are based on past buying experiences, the opinions of friends, and marketer and competitor information and promises.

Customer satisfaction with a purchase depends on how well the product's performance lives up to the customer's expectations. Customer satisfaction is a key influence on future buying behavior. Satisfied customers buy again and tell others about their good experiences. Dissatisfied customers often switch to competitors and disparage the product to others.

Marketers must be careful to set the right level of expectations. If they set expectations too low, they may satisfy those who buy but fail to attract enough buyers. If they raise expectations too high, buyers will be disappointed. Customer value and customer satisfaction are key building blocks for developing and managing customer relationships.

6.1.4 Exchange, Transactions, and Relationships

Marketing occurs when people decide to satisfy needs and wants through exchange. **Exchange** is the act of obtaining a desired object from someone by offering something in return. Whereas exchange is the core concept of marketing, a transaction, in turn, is marketing's **unit of** measurement. A **transaction** consists of a trade of values between two parties: One party gives *X* to another party and gets *Y* in return.

In the broadest sense, the marketer tries to bring about a response to some marketing offer. The response may be more than simply buying or trading products and services. A political candidate, for instance, wants votes, a church wants membership, and a social-action group wants idea acceptance.

Marketing consists of actions taken to build and maintain desirable *exchange relationships* with target audiences involving a product, service, idea, or other object. Beyond simply attracting new customers and creating transactions, the goal is to

retain customers and grow their business with the company. Marketers want to build strong economic and social connections by promising and consistently delivering superior value.

Markets

The concepts of exchange and relationships lead to the concept of a market. A **market** is the set of actual and potential buyers of a product. These buyers share a particular need or want that can be satisfied through exchange relationships. The size of a market depends on the number of people who exhibit the need, have resources to engage in exchange, and are willing to exchange these resources for what they want.

Originally the term *market* stood for the place where buyers and sellers gathered to exchange their goods, such as a village square. Economists use the term *market* to refer to a collection of buyers and sellers who transact in a particular product class, as in the housing market or the grain market. Marketers, however, see the sellers as constituting an industry and the buyers as constituting a market.

Marketers are keenly interested in markets. Each nation's economy and the whole world economy consist of complex, interacting sets of markets that are linked through exchange processes. Marketers work to understand the needs and wants of specific markets and to select the markets that they can serve best. In turn, they develop products and services that create value and satisfaction for customers in these markets. The result is profitable long-term customer relationships.

Marketing

The concept of markets finally brings us full circle to the concept of marketing. Marketing means managing markets to bring about profitable exchange relationships by creating value and satisfying needs and wants. Thus, we return to our definition of marketing as a process by which individuals and groups obtain what they need and want by creating and exchanging products and value with others.

Creating exchange relationships involves work. Sellers must search for buyers, identify their needs, design good marketing offers, set prices for them, promote them, and store and deliver them. Activities such as product development, research, communication, distribution, pricing, and service are core marketing activities. Although we normally think of marketing as being carried on by sellers, buyers also carry on marketing. Consumers do marketing when they search for the goods they

need at prices they can afford. Company purchasing agents do marketing when they track down sellers and bargain for good terms.

6.2 MARKETING MANAGEMENT

We define **marketing management** as the art and science of choosing target markets and building profitable relationships with them. This involves getting, keeping, and growing customers through creating, delivering, and communicating superior customer value. Thus, marketing management involves managing demand, which in turn involves managing customer relationships.

6.2.1 Customer and Demand Management

Some people think of marketing management as finding enough customers for the company's current output. But this view is too limited. Marketing management is not concerned with serving all customers in every way. Instead, marketers want to serve selected customers that they can serve well and profitably.

The organization has a desired level of demand for its products. At any point in time, there may be no demand, adequate demand, irregular demand, or too much demand. Marketing management must find ways to deal with these different demand states. It may be concerned not only with finding and increasing demand but also with changing or even reducing it.

For example, the Golden Gate Bridge sometimes carries an unsafe level of traffic, and Yosemite National Park is badly overcrowded in the summer. Power companies sometimes have trouble meeting demand during peak usage periods. In these and other cases of excess demand, demarketing may be required to reduce the number of customers or to shift their demand temporarily or permanently. For example, to reduce demand for space on congested expressways in Washington, D.C., the Metropolitan Washington Council of Governments has set up a Web site encouraging commuters to carpool and use mass transit. Thus, marketing management seeks to affect the types of customers served and the level, timing, and nature of their demand in a way that helps the organization achieve its objectives. Simply put, marketing management is *customer management* and *demand management*.

6.2.2 Marketing Management Orientations

We describe marketing management as carrying out tasks to build profitable relationships with target consumers. What *philosophy* should guide these marketing efforts? What weight should be given to the interests of the organization, customers, and society? Very often these interests conflict. There are five alternative concepts under which organizations conduct their marketing activities: the *production*, *product*, *selling*, *marketing*, and *societal marketing concepts*.

The production concept holds that consumers will favor products that are available and highly affordable. Therefore, management should focus on improving production and distribution efficiency. This concept is one of the oldest orientations that guides sellers.

The production concept is still a useful philosophy in two types of situations. The first occurs when the demand for a product exceeds the supply. Here, management should look for ways to increase production. The second situation occurs when the product's cost is too high and improved productivity is needed to bring it down. For example, Henry Ford's whole philosophy was to perfect the production of the Model T so that its cost could be reduced and more people could afford it. He joked about offering people a car of any color as long as it was black.

Although useful in some situations, the production concept can lead to marketing myopia. Companies adopting this orientation run a major risk of focusing too narrowly on their own operations and losing sight of the real objective—satisfying customers' needs.

The product concept holds that consumers will favor products that offer the most in quality, performance, and innovative features. Thus, an organization should devote energy to making continuous product improvements. Some manufacturers believe that if they can build a better mousetrap, the world will beat a path to their door. But they are often rudely shocked. Buyers may well be looking for a better solution to a mouse problem but not necessarily for a better mousetrap. The solution might be a chemical spray, an exterminating service, or something that works better than a mousetrap. Furthermore, a better mousetrap will not sell unless the manufacturer designs, packages, and prices it attractively; places it in convenient distribution channels; brings it to the attention of people who need it; and convinces buyers that it is a better product.

Thus, the product concept also can lead to marketing myopia. For instance, railroad management once thought that users wanted *trains* rather than *transportation* and overlooked the growing challenge of airlines, buses, trucks, and automobiles. Kodak assumed that consumers wanted photographic film rather than a way to capture and share memories and at first overlooked the challenge of digital cameras. Although it now leads the digital camera market in sales, it has yet to make significant profits from this business.

Many companies follow the **selling concept**, which holds that consumers will not buy enough of the firm's products unless it undertakes a large-scale selling and promotion effort. The concept is typically practiced with unsought goods—those that buyers do not normally think of buying, such as insurance or blood donations. These industries must be good at tracking down prospects and selling them on product benefits.

Most firms practice the selling concept when they face overcapacity. Their aim is to sell what they make rather than make what the market wants. Such marketing carries high risks. It focuses on creating sales transactions rather than on building long-term, profitable customer relationships. It assumes that customers who are coaxed into buying the product will like it. Or, if they don't like it, they will possibly forget their disappointment and buy it again later. These are usually poor assumptions. Most studies show that dissatisfied customers do not buy again. Worse yet, whereas the average satisfied customer tells three others about good experiences, the average dissatisfied customer tells ten others about his or her bad experiences.

The **marketing concept** holds that achieving organizational goals depends on knowing the needs and wants of target markets and delivering the desired satisfactions better than competitors do. Under the marketing concept, customer focus and value are the *paths* to sales and profits. Instead of a product-centered "make and sell" philosophy, the marketing concept is a customer-centered "sense and respond" philosophy. It views marketing not as "hunting," but as "gardening." The job is not to find the right customers for your product, but the right products for your customers. Instead of a product-centered "make and sell" philosophy, the marketing concept is a customer-centered "sense and respond" philosophy. It views marketing not as "hunting," but as "gardening." The job is not to find the right customers for your product, but the right products for your customers.

The **societal marketing concept** holds that the organization should determine the needs, wants, and interests of target markets. It should then deliver superior value to customers in a way that maintains or improves the consumer's *and the society's* well-being. It questions whether the pure marketing concept overlooks possible conflicts between consumer *short-run wants* and consumer *long-run welfare*. Is a firm that senses, serves, and satisfies individual short-term wants always doing what's best for consumers and society in the long run?

Consider the fast-food industry. Most people see today's giant fast-food chains as offering tasty and convenient food at reasonable prices. Yet many consumer and environmental groups have voiced concerns. Critics point out that hamburgers, fried chicken, french fries, and most other foods sold by fast-food restaurants are high in fat and salt. The products are wrapped in convenient packaging, but this leads to waste and pollution. Thus, in satisfying short-term consumer wants, the highly successful fast-food chains may be harming consumer health and causing environmental problems.

The societal marketing concept calls on marketers to balance three considerations in setting their marketing policies: company profits, consumer wants, *and* society's interests. Originally, most companies based their marketing decisions largely on short-run company profit. Eventually, they recognized the long-run importance of satisfying consumer wants, and the marketing concept emerged. Now many companies are beginning to think of society's interests when making their marketing decisions.

6.2.3 Customer Relationship Management

No matter what its orientation, marketing management's crucial task is to create profitable relationships with customers. Until recently, *customer relationship management (CRM)* has been defined narrowly as a customer database management activity. By this definition, it involves managing detailed information about individual customers and carefully managing customer. Companies today recognize that they cannot appeal to all buyers in the marketplace or least not to all buyers in the same way. Buyers are too numerous, too widely scattered, and In varied m their needs and *buying practices. Moreover, the companies themselves vary widely) their abilities to serve different segments of the market. Rather than trying to compete in an entire*

market, sometimes against superior competitors, each company must identify the market that it can serve best and most profitably.

Thus, most companies are being more choosy about the customers with whom they wish to build relationships. Most have moved away from mass marketing and toward *market segmentation and targeting*—identifying market segments, selecting one or more of them, and develop products and marketing programs tailored to each. Instead of scattering their marketing effort (the "shotgun" approach), firms are focusing on the buyers who have greater interest in the values they create best (the "rifle" approach).

Companies have not always practiced market segmentation and targeting. For most of the past century, major consumer products companies held fast to *mass marketing*—mass-producing, mass-distributing, and mass-promoting about the same product in about the same way to all consumers. Henry Ford typified this marketing strategy when he offered the Model T Ford to buyers; they could have the car "in any color as long as it is black." Similarly, Coca-Cola at one time produced only one drink for the whole market, hoping it would appeal to everyone.

These companies argued that mass marketing creates the largest potential market, which leads to the lowest costs. This, in turn, can translate into either lower prices or higher margins. However, many factors now make mass marketing more difficult. For example, the world's mass markets have slowly splintered into a profusion of smaller segments. The marketers, now find it very difficult to create a single product or program that appeals to all of these diverse groups.

The proliferation of distribution channels and advertising media has also made it difficult to practice "one-size-fits-all" marketing. Today's consumers can shop at megamalls, superstores, or specialty shops; through mail catalogs, by telephone, or from online retailers. They are bombarded with messages in media ranging from old standards such as television, radio, magazines, newspapers, and telephone to newcomers such as Web ads, faxes, and e-mails. No wonder some have claimed that mass marketing is dying. Not surprisingly, many companies are retreating from mass marketing and turning to segmented marketing.

6.3 TARGET MARKETING

There are three major steps in **target marketing**. The first is market segmentation—dividing a market into smaller groups of buyers with distinct needs, characteristics, or

behaviors who might require separate products or marketing mixes. The company identifies different ways to segment the market and develops profiles of the resulting market segments. The second step is target marketing—evaluating each market segment's attractiveness and selecting one or more of the market segments to enter. The third step is market positioning—setting the competitive positioning for the product and creating a detailed marketing mix. We discuss each of these steps in turn.

6.3.1 Market Segmentation

Markets consist of buyers, and buyers differ in one or more ways. They may differ in their wants, resources, locations, buying attitudes, and buying practices. Through market segmentation, companies divide large, heterogeneous markets into smaller segments that can be reached more efficiently and effectively with products and services that match their unique needs. In this section, we discuss four important segmentation topics: segmenting consumer markets, segmenting business markets, segmenting international markets, and requirements for effective segmentation.

Segmenting Consumer Markets

There is no single way to segment a market. A marketer has to try different segmentation variables, alone and in combination, to find the best way to view the market structure. Now we look at the major *geographic*, *demographic*, *psychographic*, and *behavioral variables*, which can be used to segment the consumer market.

Geographic Segmentation

Geographic segmentation calls for dividing the market into different geographical units such as nations, regions, states, counties, cities, or neighborhoods. A company may decide to operate in one or a few geographical areas, or to operate in all areas but pay attention to geographical differences in needs and wants.

Many companies today are localizing their products, advertising, promotion, and sales efforts to fit the needs of individual regions, cities, and even neighborhoods.

Demographic Segmentation

Demographic segmentation divides the market into groups based on variables such as age, gender, family size, family life cycle, income, occupation, education, religion, race, generation, and nationality. Demographic factors are the most popular bases for segmenting customer groups. One reason is that consumer needs, wants, and usage rates often vary closely with demographic variables. Another is that demographic variables are easier to measure than most other types of variables. Even when market segments are first defined using other bases, such as benefits sought or behavior, their demographic characteristics must be known in order to assess the size of the target market and to reach it efficiently.

Age and Life-Cycle Stage. Consumer needs and wants change with age. Some companies use age and life-cycle segmentation, offering different products or using different marketing approaches for different age and life-cycle groups. For example, McDonald's targets different age groups—from children and teens to adults and seniors—with different ads and media. Its ads to teens feature dance-beat music, adventure, and fast-paced cutting from scene to scene; ads to seniors are softer and more sentimental. Procter & Gamble boldly targets its Oil of Olay Pro Vital moisturizing creams and lotions at women over 50 years of age—it helps to improve the elasticity and revitalize the appearance of "maturing skin."

Gender segmentation has long been used in clothing, cosmetics, toiletries, and magazines. For example, Procter & Gamble was among the first with Secret, a brand specially formulated for a woman's chemistry, packaged and advertised to reinforce the female image.

Income segmentation has long been used by the marketers of products and services such as automobiles, boats, clothing, cosmetics, financial services, and travel. Many companies target affluent consumers with luxury goods and convenience services.

Psychographic segmentation divides buyers into different groups based on social class, life style or personality characteristics. People in the same demographic group can have very different psychographic makeups.

Behavioral segmentation divides buyers into groups based on their knowledge, attitudes, uses or responses to a product. Many marketers believe that behavior variables are the best starting point for building market segments.

Occasions. Buyers can be grouped according to occasions when they get the idea to buy, actually make their purchase, or use the purchased item. **Occasion segmentation**

can help firms' build up product usage. For example, orange juice is most often consumed at breakfast, but orange growers have promoted drinking orange juice as a cool and refreshing drink at other times of the day.

Benefits Sought. A powerful form of segmentation is to group buyers according to the different *benefits* that they seek from the product. **Benefit segmentation** requires finding the major benefits people look for in the product class, the kinds of people who look for each benefit, and the major brands that deliver each benefit. For example, our chapter-opening example pointed out that Procter & Gamble has identified several different laundry detergent segments. Each segment seeks a unique combination of benefits, from cleaning and bleaching to economy, fabric softening, fresh smell, strength or mildness, and lots of suds or only a few. **User Status.** Markets can be segmented into groups of nonusers, ex-users, potential users, first-time users, and regular users of a product. For example, one study found that blood donors are low in self-esteem, low risk takers, and more highly concerned about their health; nondonors tend to be the opposite on all three dimensions. This suggests that social agencies should use different marketing approaches for keeping current donors and attracting new ones. A company's market position also influences its focus. Market share leaders focus on attracting potential users, whereas smaller firms focus on attracting current users away from the market leader.

Usage Rate. Markets can also be segmented into light, medium, and heavy product users. Heavy users are often a small percentage of the market but account for a high percentage of total consumption. Marketers usually prefer to attract one heavy user to their product or service rather than several light users.

Loyalty Status. A market can also be segmented by consumer loyalty. Consumers can be loyal to brands (Tide), stores (Wal-Mart), and companies (Ford). Buyers can be divided into groups according to their degree of loyalty. Some consumers are completely loyal—they buy one brand all the time. Others are somewhat loyal—they are loyal to two or three brands of a given product or favor one brand while sometimes buying others. Still other buyers show no loyalty to any brand. They either want something different each time they buy or they buy whatever's on sale.

A company can learn a lot by analyzing loyalty patterns in its market. It should start by studying its own loyal customers.

By studying its less loyal buyers, the company can detect which brands are most competitive with its own. If many Pepsi buyers also buy Coke, Pepsi can

attempt to improve its positioning against Coke, possibly by using direct-comparison advertising. By looking at customers who are shifting away from its brand, the company can learn about its marketing weaknesses. As for non-loyals, the company may attract them by putting its brand on sale.

Target Marketing

Market segmentation reveals the firm's market segment opportunities. The firm now has to evaluate the various segments and decide how many and which ones to target. We now look at how companies evaluate and select target segments.

Evaluating Market Segments

In evaluating different market segments, a firm must look at three factors: segment size and growth, segment structural attractiveness, and company objectives and resources. The company must first collect and analyze data on current segment sales, growth rates, and expected profitability for various segments. It will be interested in segments that have the right size and growth characteristics. But "right size and growth" is a relative matter. The largest, fastest-growing segments are not always the most attractive ones for every company. Smaller companies may lack the skills and resources needed to serve the larger segments. Or they may find these segments too competitive. Such companies may select segments that are smaller and less attractive, in an absolute sense, but that are potentially more profitable for them.

The company also needs to examine major structural factors that affect long-run segment attractiveness. For example, a segment is less attractive if it already contains many strong and aggressive *competitors*. The existence of many actual or potential *substitute products* may limit prices and the profits that can be earned in a segment. The relative *power of buyers* also affects segment attractiveness. Buyers with strong bargaining power relative to sellers will try to force prices down, demand more services, and set competitors against one another—all at the expense of seller profitability. Finally, a segment may be less attractive if it contains *powerful suppliers* who can control prices or reduce the quality or quantity of ordered goods and services.

Even if a segment has the right size and growth and is structurally attractive, the company must consider its own objectives and resources in relation to that segment. Some attractive segments could be dismissed quickly because they do not mesh with the company's long-run objectives. The company must consider whether it possesses the skills and resources it needs to succeed in that segment. If the company lacks the strengths needed to compete successfully in a segment and cannot readily obtain them, it should not enter the segment. Even if the company possesses the *required* strengths, it needs to employ skills and resources *superior to* those of the competition in order to really win in a market segment. The company should enter only segments in which it can offer superior value and gain advantages over competitors.

Selecting Target Market Segments

After evaluating different segments, the company must now decide which and how many segments it will target. A target market consists of a set of buyers who share common needs or characteristics that the company decides to serve. Because buyers have unique needs and wants, a seller could potentially view each buyer as a separate target market. Ideally, then, a seller might design a separate marketing program for each buyer. However, although some companies do attempt to serve buyers individually, most face Undifferentiated Marketing

Using an **Undifferentiated marketing** (or **mass marketing**) strategy, a firm might decide to ignore market segment differences and target the whole market with one offer. This marketing strategy focuses on what is *common in* the needs of consumers rather than on what is *different*. The company designs a product and a marketing program that will appeal to all the buyers. It relies on mass distribution and mass advertising, and it aims to give the product a superior image in people's minds. Most modern marketers have strong doubts about this strategy. Difficulties arise in developing a product that will satisfy all consumers. Moreover, mass marketers often have trouble competing with more-focused firms that do a better job of satisfying the needs of specific segments and niche.

Using a **differentiated marketing** (or segmented marketing) strategy, a firm decides to cater to several market segments and designs separate offers for each.

General Motors tries to produce a car for every "purpose, purpose, and personality." Nike offers athletic shoes for a dozen or more different sports, from running, fencing, golf, and aerobics to bicycling and baseball.

By offering product and marketing variations to segments, companies hope for higher and a stronger position within each market segment. Developing a stronger position within several segments creates more total sales than Undifferentiated marketing across all segments Procter & Gamble gets more total market share with eight brands of laundry detergent as could with only one.

But differentiated marketing also increases the costs of doing business. A firm usually finds it more expensive to develop and produce, say, 10 units of 10 different products than 100 of one product. Developing separate marketing plans for the separate segments requires extra marketing research, forecasting, sales analysis, promotion planning, and channel management trying to reach different market segments with different advertising increases promotion. Thus, the company must weigh increased sales against increased costs when deciding on a differentiated marketing strategy.

6.3.2 Concentrated Marketing

A third market-coverage strategy, **concentrated marketing** (or **niche marketing**), is especially appealing when company resources are limited. Instead of going after a small share of a large market, the firm goes after a large share of one or a few segments or niches. Whereas segments are fairly large and normally attract several competitors, niches are smaller and may attract only one or a few competitors. Through concentrated marketing, the firm achieves a strong market position because of its greater knowledge of consumer needs in the niches it serves and the special reputation it acquires. It can market more *effectively by* fine-tuning its products, prices, and programs to the needs of carefully defined segments. It can also market more *efficiently*, targeting its products or services, channels, and communications programs toward only consumers that it can serve best and most profitably.

Niching offers smaller companies an opportunity to compete by focusing their limited resources on serving niches that may be unimportant to or overlooked by larger competitors.

Many companies start as nichers to get a foothold against larger, more resourceful competitors, then grow into broader competitors. For example, Southwest Airlines began by concentrating on serving intrastate, no-frills commuters in Texas but is now one of the nation's eight largest airlines. Wal-Mart, which got its start by bringing everyday low prices to small towns and rural areas, is now the world's largest company.

Today, the low cost of setting up shop on the Internet makes it even more profitable to serve seemingly minuscule niches. Small businesses, in particular, are realizing riches from serving small niches on the Web. Here is a "Webpreneur" who achieved astonishing results:

Whereas Internet giants like Amazon.com have yet to even realize a consistent profit, Steve Warrington is earning a six-figure income online selling ostriches—and every product derived from them—online.

6.3.3 Micromarketing

Differentiated and concentrated marketers tailor their offers and marketing programs to meet the needs of various market segments and niches. At the same time, however, they do not customize their offers to each individual customer. **Micromarketing** is the practice of tailoring products and marketing programs to suit the tastes of specific individuals and locations. Micromarketing includes *local marketing* and *individual marketing*.

Local Marketing. Local marketing involves tailoring brands and promotions to the needs and wants of local customer groups—cities, neighborhoods, and even specific stores. Retailers such as Sears and Wal-Mart routinely customize each store's merchandise and promotions to match its specific clientele. Citibank provides different mixes of banking services in its branches, depending on neighborhood demographics. Kraft helps supermarket chains identify the specific cheese assortments and shelf positioning that will optimize cheese sales in low-income, middle-income, and high-income stores and in different ethnic communities.

Local marketing has some drawbacks. It can drive up manufacturing and marketing costs by reducing economies of scale. It can also create logistics problems as companies try to meet the varied requirements of different regional and local markets. Further, a brand's overall image might be diluted if the product and message

vary too much in different localities. Still, as companies face increasingly fragmented markets, and as new supporting technologies develop, the advantages of local marketing often outweigh the drawbacks. Local marketing helps a company to market more effectively in the face of pronounced regional and local differences in demographics and lifestyles. It also meets the needs of the company's first-line customers—retailers—who prefer more fine-tuned product assortments for their neighborhoods.

Individual Marketing. In the extreme, micromarketing becomes individual marketing—tailoring products and marketing programs to the needs and preferences of individual customers. Individual marketing has also been labeled *one-to-one marketing*, *customized marketing*, and *markets-of-one marketing*.

The widespread use of mass marketing has obscured the fact that for centuries consumers were served as individuals: The tailor custom-made the suit, the cobbler designed shoes for the individual, the cabinetmaker made furniture to order. Today, however, new technologies are permitting many companies to return to customized marketing. More-powerful computers, detailed databases, robotic production and flexible manufacturing, and immediate and interactive communication media such as e-mail, fax, and the Internet—all have combined to foster "*mass customization*." *Mass customization is the process through which firms interact one-to-one with masses of customers to create customer-unique value by designing products and services tailor-made to individual needs.*

Thus, Dell Computer delivers computers to individual customers loaded with customer-specified hardware and software.

6.4 Positioning for Competitive Advantage

Beyond deciding which segments of the market it will target, the company must decide what positions it wants to occupy in those segments. A **product's position** is the way the product is *defined by consumers* on important attributes—the place the product occupies in consumers' minds relative to competing products. Positioning involves implanting the brand's unique benefits and differentiation in customers' minds. Tide is positioned as a powerful, all-purpose family detergent; Ivory Snow is positioned as the gentle detergent for fine washables and baby clothes. In the automobile market, the Toyota Echo and Ford Focus are positioned on

economy, Mercedes and Cadillac on luxury, and Porsche and BMW on performance. Volvo positions powerfully on safety. At Subway restaurants, you "Eat Fresh." At Olive Garden restaurants, "When You're Here, You're Family."

Consumers are overloaded with information about products and services. They cannot reevaluate products every time they make a buying decision. To simplify the buying process, consumers organize products, services, and companies into categories and "position" them in their minds. A product's position is the complex set of perceptions, impressions, and feelings that consumers have for the product compared with competing products.

Consumers position products with or without the help of marketers. But marketers do not want to leave their products' positions to chance. They must *plan* positions that will give their products the greatest advantage in selected target markets, and they must design marketing mixes **to** create these planned positions.

6.5 Choosing a Positioning Strategy

Some firms find it easy to choose their positioning strategy. For example, a firm well known for quality in certain segments will go for this position in a new segment if there are enough buyers seeking quality. But in many cases, two or more firms will go after the same position. Then, each will have to find other ways to set itself apart. Each firm must differentiate its offer by building a unique bundle of benefits that appeals to a substantial group within the segment.

The positioning task consists of three steps: identifying a set of possible competitive advantages upon which to build a position, choosing the right competitive advantages, and selecting an overall positioning strategy. The company must then effectively communicate and deliver the chosen position to the market.

Identifying Possible Competitive Advantages

The key to winning and keeping target customers is to understand their needs better than competitors do and to deliver more value. To the extent that a company can position itself as providing superior value, it gains **competitive** advantage. But solid positions cannot be built on empty promises. If a company positions its product as *offering* the best quality and service, it must then *deliver the* promised quality and

service. Thus, positioning begins with actually *differentiating the* company's marketing offer so that it will give consumers more value than competitors' offers do.

To find points of differentiation, marketers must think through the customer's entire experience with the company's product or service. An alert company can find ways to differentiate itself at every point where it comes in contact with customers. In what specific ways can a company differentiate its offer from those of competitors? A company or market offer can be differentiated along the lines of *product, services, channels, people, or image*.

Product differentiation takes place along a continuum. At one extreme we find physical products that allow little variation: chicken, steel, aspirin. Yet even here some meaningful differentiation is possible. For example, Perdue claims that its branded chickens are better—fresh and more tender—and gets a 10 percent price premium based on this differentiation. At other extreme are products that can be highly differentiated, such as automobiles, clothing, and furniture. Such products can be differentiated on features, performance, or style and design.

Beyond differentiating its physical product, a firm can also differentiate the services accompany the product. Some companies gain *services differentiation* through speedy, convenient, or careful *delivery*. For example, BankOne has opened full-service branches in super markets to provide location convenience along with Saturday, Sunday, and weekday-evening hours.

Installation can also differentiate one company from another, as can *repair* services. Many a automobile buyer will gladly pay a little more and travel a little farther to buy a car from a dealer that provides top-notch repair services. Some companies differentiate their offers by providing *customer training service* or *consulting services*—data, information systems, and advising services. Firms that practice *channel differentiation* gain competitive advantage through the way they design their channel's coverage, expertise, and performance. Caterpillar's success in the construction-equipment industry is based on superior channels. Its dealers worldwide are renowned for their first-rate service. Amazon.com, Dell Computer, and Avon distinguish themselves by their high-quality direct channels. And Iams pet food achieved success by going against tradition, distributing its products only through veterinarians and pet stores.

Companies can gain a strong competitive advantage through *people differentiation*—hiring and training better people than their competitors do. Thus,

Disney people are known to be friendly and upbeat. Singapore Airlines enjoys an excellent reputation largely because of the grace of its flight attendants. IBM offers people who make sure that the solution customers want is the solution they get: "People Who Get It. People Who Get It Done." People differentiation requires that a company select its customer-contact people carefully and train them well. For example, Disney trains its theme park people thoroughly to ensure that they are competent, courteous, and friendly—from the hotel check-in agents, to the monorail drivers, to the ride attendants, to the people who sweep Main Street USA. Each employee understands the importance of understanding customers, communicating with them cheerfully, and responding quickly to their requests and problems. Each is carefully trained to "make people happy."

Even when competing offers look the same, buyers may perceive a difference based on company or brand *image differentiation*. A company or brand image should convey the product's distinctive benefits and positioning. Developing a strong and distinctive image calls for creativity and hard work. A company cannot plant an image in the public's mind overnight using only a few advertisements. If Ritz-Carlton means quality, this image must be supported by everything the company says and does. *Symbols*—such as the McDonald's golden arches, the Prudential rock, the Nike swoosh, the Intel Inside logo, or the Pillsbury doughboy—can provide strong company or brand recognition and image differentiation. The company might build a brand around a famous person, as Nike did with its Air Jordan basketball shoes and Tiger Woods golfing products. Some companies even become associated with colors, such as IBM (blue), Campbell (red and white), or UPS (brown). The chosen symbols, characters, and other image elements must be communicated through advertising that conveys the company's or brand's personality.

What is a Product?

A Sony DVD player, a Ford Taurus, a Costa Rican vacation, a Caffe Mocha at Starbucks, Cha Schwab online investment services, and advice from your family doctor—all are products. Define a **product** as anything that can be offered to a market for attention, acquisition, use consumption and that might satisfy a want or need. Products include more than just tangible goods. Broadly defined, products include physical objects, services, events, persons, places, organizations, ideas, or mixes of

these entities. Thus, throughout this text, we use the term *product* broadly to include any or all of these entities.

Because of their importance in the world economy, we give special attention to services. **Services** are a form of product that consists of activities, benefits, or satisfactions offered for that are essentially intangible and do not result in the ownership of anything. Examples are hotel, airline, retail, tax preparation, and home repair services.

Products, Services, and Experiences

Product is a key element in the *market offering*. Marketing-mix planning begins with formulating an offering that brings value to target customers and satisfies their needs. This offering becomes the basis upon which the company builds profitable relationships with customers.

A company's market offering often includes both tangible goods and services. Each component can be a minor or a major part of the total offer. At one extreme, the offer may consist of a *pure tangible good*, such as soap, toothpaste, or salt—no services accompany the product. At the other extreme are *pure services*, for which the offer consists primarily of a service. Examples include a doctor's exam or financial services. Between these two extremes, however, many goods-and-services combinations are possible.

Today, as products and services become more and more commoditized, many companies are moving to a new level in creating value for their customers. To differentiate their offers, they are developing and delivering total customer *experiences*. Whereas products are tangible and services are intangible, experiences are memorable. Whereas products and services are external, experiences are personal and take place in the minds of individual consumers. Companies that market experiences realize that customers are really buying much more than just products and services. They are buying what those offers will *do* for them.

Levels of Product and Services

Product planners need to think about products and services on three levels. Each level adds more customer value. The most basic level is the *core benefit*, which addresses the question *What is the buyer really buying?* When designing products,

marketers must first define the core, problem-solving benefits or services that consumers seek. A woman buying lipstick buys more than lip color. Charles Revson of Revlon saw this early: "In the factory, we make cosmetics; in the store, we sell hope." Charles Schwab does more than sell financial services—it promises to fulfill customers' "financial dreams."

At the second level, product planners must turn the core benefit into an *actual product*. They need to develop product and service features, design, a quality level, a brand name, and packaging. For example, a Sony camcorder is an actual product. Its name, parts, styling, features, packaging, and other attributes have all been combined carefully to deliver the core benefit—a convenient, high-quality way to capture important moments.

Finally, product planners must build an *augmented product around* the core benefit and actual product by offering additional consumer services and benefits. Sony must offer more than just a camcorder. It must provide consumers with a complete solution to their picture-talking problems. Sony and its dealers also might give buyers a warranty on parts and workmanship, instructions on how to use the camcorder, quick repair services when needed, and a toll-free telephone number to call if they have problems or questions.

Consumers see products as complex bundles of benefits that satisfy their needs. When developing products, marketers first must identify the *core* consumer needs the product will satisfy. They must then design the *actual* product and find ways to *augment* it in order to create the bundle of benefits that will provide the most satisfying customer experience.

Product and Service Classifications

Products and services fall into two broad classes based on the types of consumers that use them—*consumer products* and *industrial products*. Broadly defined, products also include other marketable entities such as experiences, organizations, persona, places, and ideas.

Consumer Products

Consumer products are products and services bought by final consumers for personal consumption. Marketers usually classify these products and services further based on how consumers go about buying them. Consumer products include

convenience products, shopping products, specialty products, and unsought products. These products differ in the ways consumers buy them and therefore in how they are marketed.

Convenience products are consumer products and services that the customer usually buys frequently, immediately, and with a minimum of comparison and buying effort. Examples include soap, candy, newspapers, and fast food. Convenience products are usually low priced, and marketers place them in many locations to make them readily available when customers need them.

Shopping products are less-frequently-purchased consumer products and services that customers compare carefully on suitability, quality, price, and style. When buying shopping products and services, consumers spend much time and effort in gathering information and making comparisons. Examples include furniture, clothing, used cars, major appliances, and hotel and airline services. Shopping products marketers usually distribute their products through fewer outlets but provide deeper sales support to help customers in their comparison efforts.

Specialty products are consumer products and services with unique characteristics or brand identification for which a significant group of buyers is willing to make a special purchase effort. Examples include specific brands and types of cars, high-priced photographic equipment, designer clothes, and the services of medical or legal specialists. A Lamborghini automobile, for example, is a specialty product because buyers are usually willing to travel great distances to buy one. Buyers normally do not compare specialty products. They invest only the time needed to reach dealers carrying the wanted products.

Unsought products are consumer products that the consumer either does not know about or knows about but does not normally think of buying. Most major new innovations are unsought until the consumer becomes aware of them through advertising. Classic examples of known but unsought products and services are life insurance, cemetery plots, and blood donations to the Red Cross. By their very nature, unsought products require a lot of advertising, personal selling, and other marketing efforts.

Industrial Products

Industrial products are those purchased for further processing or for use in conducting a business. Thus, the distinction between a consumer product and an industrial product is based on the *purpose* for which the product is bought. If a

consumer buys a lawn mower for use around home, the lawn mower is a consumer product. If the same consumer buys the same lawn mower for use in a landscaping business, the lawn mower is an industrial product.

The three groups of industrial products and services include materials and parts, capital items, and supplies and services. *Materials and parts* include raw materials and manufactured materials and parts. Raw materials consist of farm products (wheat, cotton, livestock, fruits, vegetables) and natural products (fish, lumber, crude petroleum, iron ore). Manufactured materials and parts consist of component materials (iron, yarn, cement, wires) and component parts (small motors, tires, castings). Most manufactured materials and parts are sold directly to industrial users. Price and service are the major marketing factors; branding and advertising tend to be less important.

Capital items are industrial products that aid in the buyer's production or operations, including installations and accessory equipment. Installations consist of major purchases such as buildings (factories, offices) and fixed equipment (generators, drill presses, large computer systems, and elevators). Accessory equipment includes portable factory equipment and tools (hand tools, lift trucks) and office equipment (computers, fax machines, desks). They have a shorter life than installations and simply aid in the production process.

The final group of business products is *supplies and services*. *Supplies* include operating supplies (*lubricants, coal, paper, pencils*) and *repair and maintenance items* (paint, nails, brooms). *Supplies* are the convenience products of *the industrial field* because they are *usually purchased* with a minimum of effort or comparison. Business services include maintenance and repair services (window cleaning, computer repair) and business advisory services (legal, management consulting, and advertising). Such services are usually supplied under contract.

Organizations, Persons, Places, and Ideas

In addition to tangible products and services, in recent years marketers have broadened the concept of a product to include other market offerings—organizations, persons, places, and ideas.

Organizations often carry out activities to "sell" the organization itself. *Organization marketing* consists of activities undertaken to create, maintain, or change the attitudes and behavior of target consumers toward an organization. Both profit and

nonprofit organizations practice organization marketing. Business firms sponsor public relations or corporate advertising campaigns to polish their images. *Corporate image advertising* is a major tool companies use to market themselves to various publics. For example, Lucent puts out ads with the tag line "We make the things that make communications work." IBM wants to establish itself as the company to turn to for "e-Business Solutions." And General Electric "brings good things to life." Similarly, not-for-profit organizations, such as churches, colleges, charities, museums, and performing arts groups, market their organizations in order to raise funds and attract members or patrons.

People can also be thought of as products. *Person marketing* consists of activities undertaken to create, maintain, or change attitudes or behavior toward particular people. All kinds of people and organizations practice person marketing. Today's presidents market themselves, their parties, and their platforms to get needed votes and program support. Entertainers and sports figures use marketing to promote their careers and improve their impact and incomes. Professionals such as doctors, lawyers, accountants, and architects market themselves in order to build their reputations and increase business. Businesses, charities, sports teams, fine arts groups, religious groups, and other organizations also use person marketing. Creating or associating with well-known personalities often helps these organizations achieve their goals better. That's why more than a dozen different companies combined—including Nike, Target, Buick, American Express, Disney, and Titleist—pay more than \$50 million a year to link themselves with golf superstar Tiger Woods.

Place marketing involves activities undertaken to create, maintain, or change attitudes or behavior toward particular places. Cities, states, regions, and even entire nations compete to attract tourists, new residents, conventions, and company offices and factories. Texas advertises "It's Like a Whole Other Country," and New York State shouts, "I Love New York!" Michigan says "Great Lakes, Great Times" to attract tourists, "Great Lakes, Great Jobs" to attract residents, and "Great Lakes, Great Location" to attract businesses. The Irish Development Agency has attracted more than 1,200 companies to locate their plants in Ireland. At the same time, the Irish Tourist Board has built a flourishing tourism business by advertising "Live a different life: friendly, beautiful, relaxing." And the Irish Export Board has created attractive markets for Irish exports.

Ideas can also be marketed. In one sense, all marketing is the marketing of an idea, whether it be the general idea of brushing your teeth or the specific idea that Crest toothpastes "create smiles every day." Here, however, we narrow our focus to the marketing of *social ideas*. This area has been called **social marketing**, defined by the Social Marketing Institute as the use of commercial marketing concepts and tools in programs designed to influence individuals' behavior to improve their well-being and that of society.⁶ Such programs include public health campaigns to reduce smoking, alcoholism, drug abuse, and overeating. Other social marketing efforts include environmental campaigns to promote wilderness protection, clean air, and conservation. Still others address issues such as family planning, human rights, and racial equality.

6.5 Product and Service Decisions

Marketers make product and services decisions at three levels: individual product decisions, product line decisions, and product mix decisions. We discuss each in turn.

Individual Product and Service Decisions

We will focus on decisions about product attributes, branding, packaging, labeling, and product support services.

Product and Service Attributes

Developing a product or service involves defining the benefits that it will offer. These benefits are communicated and delivered by product attributes such as quality, features, and style and design.

Product Quality

Product quality is one of the marketer's major positioning tools. Quality has a direct impact on satisfaction. In the narrowest sense, quality can be defined as "freedom from defects." But most customer-centered companies go beyond this narrow definition. Instead, they define quality in terms of customer satisfaction.

Total quality management (TQM) is an approach in which all the company's people are involved in constantly improving the quality of products, services, and business processes. During the past two decades, companies large and small have

credited TQM with greatly improve their market shares and profits. Product quality has two dimensions—level and consistency. In developing a product, the marketer must first choose a *quality level* that will support the product's position in the target market. Here, product quality means *performance quality*—the ability of a product to perform its functions. For example, a Rolls-Royce provides higher performance quality than a Chevrolet: It has a smoother ride, handles better, and lasts longer. Companies rarely try to offer the highest possible performance quality level—few customers want or can afford the high levels of quality offered in products such as a Rolls-Royce automobile, a Sub-Zero refrigerator, or a Rolex watch. Instead, companies choose a quality level that matches target market needs and the quality levels of competing products.

Beyond quality level, high quality also can mean high levels of quality *consistency*. Here, product quality means *conformance quality*—freedom from defects and *consistency* in delivering a targeted level of performance. All companies should strive for high levels of conformance quality. In this sense, a Chevrolet can have just as much quality as a Rolls-Royce. Although a Chevy doesn't perform as well as a Rolls, it can as consistently deliver the quality that customers pay for and expect.

Many companies today have turned customer-driven quality into a potent strategic weapon. They create customer satisfaction and value by consistently and profitably meeting customer's needs and preferences for quality.

Product Features. A product can be offered with varying features. A stripped-down model, one without any extras, is the starting point. The company can create *higher-level models* by adding more features. Features are a competitive tool for differentiating the company's product from competitors' products. Being the first producer to introduce a needed and valued new feature is one of the most effective ways to compete.

How can a company identify new features and decide which ones to add to its product? The company should periodically survey buyers who have used the product and ask these questions? How do you like the product? Which specific features of the product do you like most? Which features could we add to improve the product? The answers provide the company with a rich list of feature ideas. The company can then assess each feature's *value* to customers versus its cost to the company. Features that

customers value little in relation to costs should be dropped; those that customers value highly in relation to costs should be added.

Product Style and Design Another way to add customer value is through distinctive *product style and design*. Design is a larger concept than style. *Style* simply describes the appearance of a product. Styles can be eye-catching or yawn producing. A sensational style may grab attention and produce pleasing aesthetics, but it does not necessarily make the product *perform* better. Unlike style, *design* is more than skin deep—it goes to the very heart of a product. Good design contributes to a product's usefulness as well as to its looks.

Good style and design can attract attention, improve product performance, cut production costs, and give the product a strong competitive advantage in the target market.

Branding

Perhaps the most distinctive skill of professional marketers is their ability to create, maintain, protect, and enhance brands of their products and services. A **brand** is a name, term, sign, symbol, or design, or a combination of these, that identifies the maker or seller of a product or service. Consumers view a brand as an important part of a product, and branding can add value to a product. For example, most consumers would perceive a bottle of White Linen perfume as a high-quality, expensive product. But the same perfume in an unmarked bottle would likely be viewed as lower in quality, even if the fragrance were identical.

Branding has become so strong that today hardly anything goes unbranded. Salt is packaged in branded containers; common nuts and bolts are packaged with a distributor's label, and automobile parts—spark plugs, tires, filters—bear brand names that differ from those of the automakers. Even fruits, vegetables, and poultry are branded—Sunkist oranges, Dole pineapples, Chiquita bananas, Fresh Express salad greens, and Perdue chickens.

Branding helps buyers in many ways. Brand names help consumers identify products that might benefit them. Brands also tell the buyer something about product quality. Buyers who always buy the same brand know that they will get the same features, benefits, and quality each time they buy. Branding also gives the seller several advantages. The brand name becomes the Packaging

Packaging involves designing and producing the container or wrapper for a product. The package includes a product's primary container (the tube holding Colgate Total toothpaste). It may also include a secondary package that is thrown away when the product is about to be used (the cardboard box containing the tube of Colgate). Finally, it can include a shipping package necessary to store, identify, and ship the product (a corrugated box carrying six dozen tubes of Colgate). Labeling—printed information appearing on or with the package—is also part of packaging.

Traditionally, the primary function of the package was to contain and protect the product. In recent times, however, numerous factors have made packaging an important marketing tool. Increased competition and clutter on retail store shelves means that packages must now perform many sales tasks—from attracting attention, to describing the product, to making the sale.

Companies are realizing the power of good packaging to create instant consumer recognition of the company or brand. For example, in an average supermarket, which stocks 15,000 to 17,000 items, the typical shopper passes by some 300 items per minute, and more than 60 percent of all purchases are made on impulse. In this highly competitive environment, the package may be the seller's last chance to influence buyers. It becomes a "five-second commercial." The Campbell Soup Company estimates that the average shopper sees its familiar red-and-white can 76 times a year, creating the equivalent of \$26 million worth of advertising.

Innovative packaging can give a company an advantage over competitors. In contrast, poorly designed packages can cause headaches for consumers and lost sales for the company. Developing a good package for a new product requires making many decisions. First, the company must establish the *packaging concept*, which states what the package should *be* or *do* for the product. Should it mainly offer product protection, introduce a new dispensing method, suggest certain qualities about the product, or do something else? Decisions then must be made on specific elements of the package, such as size, shape, materials, color, text, and brand mark. These elements must work together to support the product's position and marketing strategy.

Labeling

Labels may range from simple tags attached to products to complex graphics that are part of the package. They perform several functions. At the very least, the label *identifier* the product or brand, such as the name Sunkist stamped on oranges.

The label might also *describe* several things about the product—who made it, where it was made, when it was made, its contents, how it is to be used, and how to use it safely. Finally, the label might *promote* the product through attractive graphics.

Labeling has been affected in recent times by *unit pricing* (stating the price per unit of standard measure), *open dating* (stating the expected shelf life of the product), and *nutritional labeling* (stating the nutritional values in the product). the use of health-related terms such as *low-fat*, *light*, and *high-fiber*. Sellers must ensure that their labels contain all the required information.

Product Support Services

Customer service is another element of product strategy. A company's offer to the marketplace usually includes some support services, which can be a minor or a major part of the total offering.

The first step is to survey customers periodically to assess the value of current services and to obtain ideas for new ones. For example, Cadillac holds regular focus group interviews with owners and carefully watches complaints that come into its dealerships. From this careful monitoring, Cadillac has learned that buyers are very upset by repairs that are not done correctly the first time.

Once the company has assessed the value of various support services to customers, it must next assess the costs of providing these services. It can then develop a package of services that will both delight customers and yield profits to the company. Based on its consumer interviews, Cadillac has set up a system directly linking each dealership with a group of 10 engineers who can help walk mechanics through difficult repairs. Such actions helped Cadillac jump, in one year, from fourteenth to seventh in independent rankings of service.

Many companies are now using the Internet and other modern technologies to provide support services that were not possible before. Using the Web, 24-hour telephone help lines, self-service kiosks, and other digital technologies, these companies are now empowering consumers to tailor their own service and support experiences. For example, Kaiser-Permanente, the nation's largest health maintenance organization (HMO), has rolled out a Web site that lets members register online for office visits and send e-mail questions to nurses and pharmacists (and get responses within 24

hours). Kaiser also plans to give members access to lab results and pharmaceutical refills online.

Product Line Decisions

Beyond decisions about individual products and services, product strategy also calls for building a product line. A **product line** is a group of products that are closely related because they function in a similar manner, are sold to the same customer groups, are marketed through the same types of outlets, or fall within given price ranges. For example, Nike produces several lines of athletic shoes and apparel, Nokia produces several lines of telecommunications products, and Charles Schwab produces several lines of financial services.

The major product line decision involves *product line length*—the number of items in the product line. The line is too short if the manager can increase profits by adding items; the line is too long if the manager can increase profits by dropping items. The company should manage its product lines carefully. Product lines tend to lengthen over time, and most companies eventually need to prune unnecessary or unprofitable items from their lines to increase overall profitability.

Product line length is influenced by company objectives and resources. For example, one objective might be to allow for upselling. Thus BMW wants to move customers up from its 3-series models to 5- and 7-series models. Another objective might be to allow cross-selling: Hewlett-Packard sells printers as well as cartridges. Still another objective might be to protect against economic swings: Gap runs several clothing-store chains (Gap, Old Navy, Banana Republic) covering different price points.

A company can lengthen its product line in two ways: by *line stretching* or by *line filling*. *Product line stretching* occurs when a company lengthens its product line beyond its current range. The company can stretch its line downward, upward, or both ways.

Companies located at the upper end of the market can stretch their lines *downward*. A company may stretch downward to plug a market hole that otherwise would attract a new competitor or to respond to a competitor's attack on the upper end. Or it may add low-end products because it finds faster growth taking place in the low-end segments. DaimlerChrysler stretched its Mercedes line downward for all these reasons. Facing a slow-growth luxury car market and attacks by Japanese

automakers on its high-end positioning, it successfully introduced its Mercedes C-Class cars. These models sell at less than \$30,000 without harming the firm's ability to sell other Mercedes for \$100,000 or more. Similarly, Rolex launched its Rolex Tudor watch retailing for about \$1,350, compared with a Rolex Submariner, usually priced at \$3,875.¹⁶

Companies at the lower end of a market can stretch their product lines *upward*. Sometimes, companies stretch upward in order to add prestige to their current products. Or they may be attracted by a faster growth rate or higher margins at the higher end. For example, each of the leading Japanese auto companies introduced an upmarket automobile: Toyota launched Lexus, Nissan launched Infinity, and Honda launched Acura. They used entirely new names rather than their own names.

Companies in the middle range of the market may decide to stretch their lines in *both directions*. Marriott did this with its hotel product line. Along with regular Marriott hotels, it added the Renaissance Hotels line to serve the upper end of the market and the TownePlace Suites line to serve the moderate and lower ends. Each branded hotel line is aimed at a different target market. Renaissance aims to attract and please top executives; Marriotts, upper and middle managers; An alternative to product line stretching is *product line filling*—adding more items within the present range of the line. There are several reasons for product line filling: reaching for extra profits, satisfying dealers, using excess capacity, being the leading full-line company, and plugging holes to keep out competitors. Sony filled its Walkman line by adding solar-powered and water-proof Walkmans, an ultralight model that attaches to a sweatband for exercisers, the MiniDisc Walkman, the CD Walkman, and the Memory Stick Walkman, which enables users to download tracks straight from the Net. However, line filling is overdone if it results in cannibalization and customer confusion. The company should ensure that new items are noticeably different) existing ones.

6.6 Product Mix Decisions

An organization with several product lines has a product mix. A **product mix** (or product assortment) consists of all the product lines and items that a particular seller offers for sale. Avon's product mix consists of four major product lines: beauty products, wellness products, jewelry and accessories and "inspirational" products (gifts, books, music, and home accents). Each product line consists several sublines. For example, the beauty line breaks down into makeup, skin care, bath and beai fragrance, and outdoor protection products. Each line and subline has many individual items. Altogether, Avon's product mix includes 1,300 items. In contrast, a typical Kmart stocks 15,000 items 3M markets more than 60,000 products, and General Electric manufactures as many as 250,000 items.

A company's product mix has four important dimensions: width, length, depth, and consistency. Product mix *width* refers to the number of different product lines the company carries. Pro & Gamble markets a fairly wide product mix consisting of 250 brands organized into many product lines. These lines include fabric and home care, baby care, feminine care, beauty care, health care, a food and beverage products. Product mix *length* refers to the total number of items the company carries within its product lines. P&G typically carries many brands within each line. For example, it s seven laundry detergents, six hand soaps, five shampoos, and tour dishwashing detergents.

Product line *depth* refers to the number of versions offered of each product in the line. Thus, P&G's Crest toothpaste comes in 13 varieties, ranging from Crest Multicare, Crest Cavity Protection, and Crest Tartar Protection to Crest Sensitivity Protection, Crest Dual Action Whitening, Crest Whitening Plus Scope, Kid's Cavity Protection, and Crest Baking Soda & Peroxide Whitening formulations.

Finally, the *consistency* of the product mix refers to how closely related the various product lines are in end use, production requirements, distribution channels, or some other way. P&G's product lines are consistent insofar as they are consumer products that go through the same distribution channels. The lines are less consistent insofar as they perform different functions for buyers.

These product mix dimensions provide the handles for defining the company's product strategy. The company can increase its business in four ways. It can add new product lines, thus widening its product mix. In this way, its new lines build on the company's reputation in its other lines. The company can lengthen its existing product lines to become a more full-line company. Or it can add more versions of each product and thus deepen its product mix. Finally, the company can pursue more product line consistency—or less—depending on whether it wants to have a strong reputation in a single field or in several fields.

SUMMARY

Marketing is a social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others. Significantly, companies address needs by putting forth a value proposition which is a set of benefits that they promise to consumers to satisfy their needs. Hereby marketing management is defined as the art and science of choosing target markets and building profitable relationships between organizations and customers. This involves getting, keeping, and growing customers through creating, delivering, and communicating superior customer value. There are three major steps in target marketing. The first is market segmentation—dividing a market into smaller groups of buyers with distinct needs, characteristics, or behaviors who might require separate products or marketing mixes. The company identifies different ways to segment the market and develops profiles of the resulting market segments. The second step is target marketing—evaluating each market segment's attractiveness and selecting one or more of the market segments to enter. The third step is market positioning—setting the competitive positioning for the product and creating a detailed marketing mix.

FOR DISCUSSION

1. Define what marketing is and discuss its core concepts.
2. Define marketing management and compare the five marketing management orientations.
3. Discuss customer relationship management.
4. Define the three steps of target marketing: market segmentation, target marketing, and market positioning.
5. List and discuss the major bases for segmenting markets.
6. Discuss how companies can position their products for maximum competitive advantage in the marketplace.
7. Define product and the major classifications of products and services.
8. Describe the decisions companies make regarding their individual products and services, product lines, and product mixes.

SUGGESTED TEXT BOOKS

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3. Neelamegham S, “Marketing management and Indian Economy”, Vikas Publishing House, India, 1998.

Chapter 7

FINANCIAL MANAGEMENT

FINANCIAL MANAGEMENT

SCOPE OF THE COURSE

After reading chapter 7, you should be able to:

- Understand the fundamentals of accounting
- Explain the elements of cost
- Understand when order would be placed to purchase materials
- Know about inventory systems and wage systems
- Distinguish between management and cost accounting
- Understand cost-volume profit analysis and break even analysis

INTRODUCTION TO FINANCIAL ACCOUNTING

7.1 Definition of accounting

In 1941, the committee on terminology of the American Institute of certified public accounts (AICPA) formulated the following definition which was widely quoted for many years:

“Accounting is the art of recording, classifying and summing in a significant manner, and in terms of money transactions and events which are, in part at least, of a financial character, and interpreting the results thereof.”

In 1966, the American accounting association (AAA), in order to emphasize the broader perspective of accounting, provided the following definition of accounting.

“Accounting is the process of identifying, measuring and communicating economic information to permit informed judgments and decisions by users of the information.”

More recently, in 1970 the AICPA of the US defined accounting with reference to the concept of information.”

“Accounting is a service activity. Its function is to provide quantitative information, primarily financial in nature, and about economic activities, that is intended to be useful in making decisions that effect the organization. Today’s accounting focuses on the ultimate needs of those, who use accounting information, whether these users are inside or outside the business itself.

Users of accounting information

Accounting provides useful information about the activities of an entity to individuals or group a for their use in making informed judgments and decisions. The users of accounting information can be broadly divided into categories:

1. Management if managers
2. Users with direct financial interest
3. Users with indirect financial interest

Fig. 7.1 shows different users of accounting information and different decision made by them.

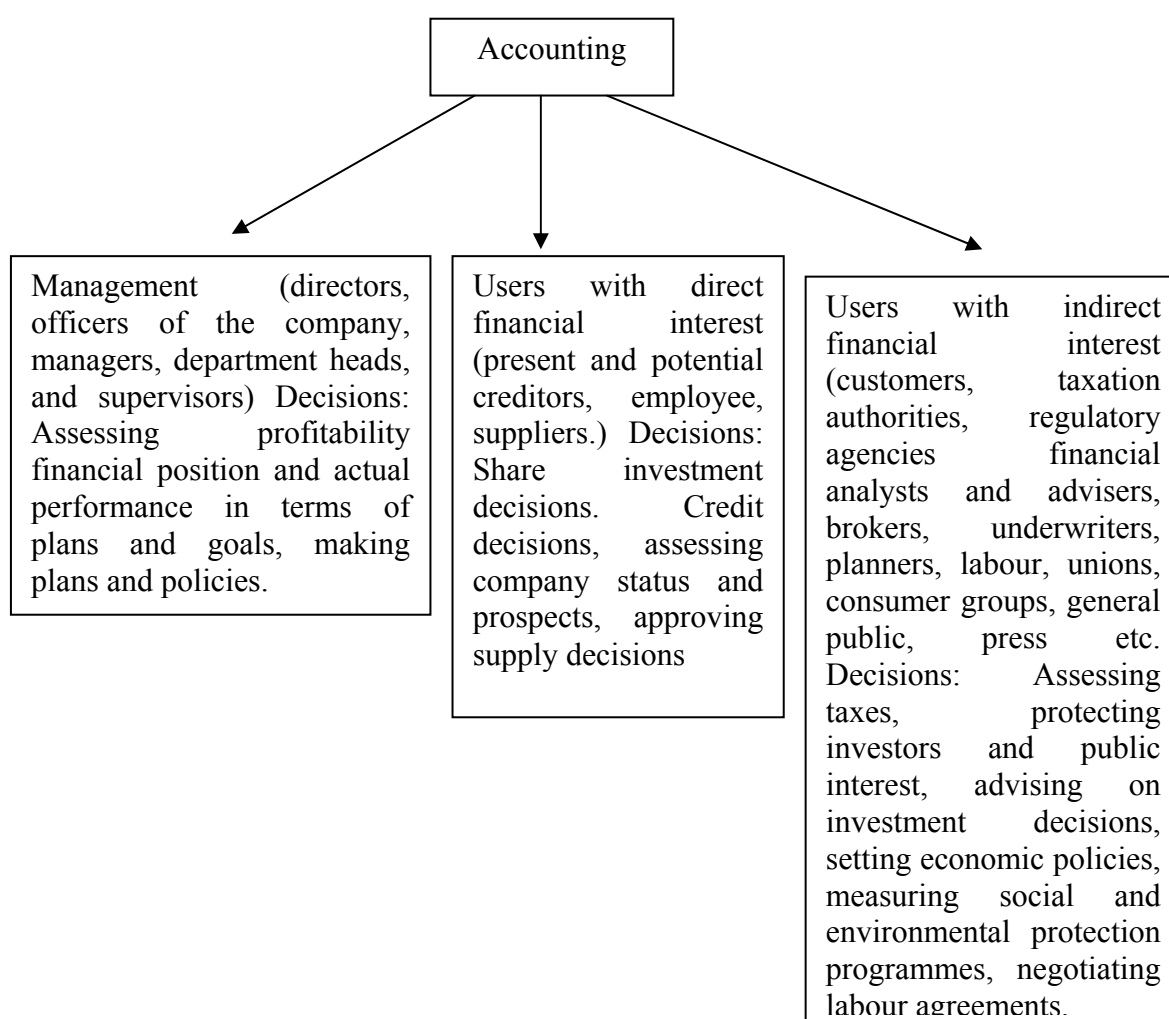


Fig. 7.1: Different Users of Accounting information

Principal Financial Statements

The end product of the financial accounting process is a set of reports that are called financial statements. The following constitute the financial statements:

1. Profit and loss account
2. Balance Sheet
3. Statement of Changes in Financial Position (SCFP)

Profit and loss account also known as income statement, presents the results of operations of a business enterprise for a period of time. This statement shows net profit or net income of an entity for a period of time.

Balance sheet shows the financial position of a business on a certain date. For this reason, it is often called the statement of financial position... Balance sheet indicates the investing and financing activities of a business enterprise at a point of time and shows a firm's assets, liabilities and equity capital.

A Statement of changes in Financial Position (SCFP) shows where financial resources (funds) have come from (sources) and where they have gone (users).

7.1 Postulates, Concepts And Principles

Postulates

Accounting postulates are basic assumptions which are generally accepted as self-evident truths in accounting. Postulates are established or general truths which do not require any evidence to prove them. They are the propositions taken for granted.

Concepts

Accounting concepts are also self-evident statements or truths. Accounting concepts provide the conceptual guidelines for application in the financial accounting process. The concepts are important because they (a) help explain the 'why' of accounting (b) provide guidance when new accounting situations are encountered, and (c) significantly reduce the need to memorize accounting procedures when learning about accounting.

Accounting Postulates

1. Entity Postulate: The entity postulate assumes that the financial statements and other accounting information are for the specific business enterprise which is

distinct from its owners. Attention in financial accounting is focused on the economic activities of individual business enterprise.

2. **Going Concern Postulate:** An accounting entity is viewed as continuing in operation in the absence of evidence to the contrary. Because of the relative permanence of enterprises, financial accounting is formulated assuming that the business will continue to operate for an indefinitely long period in the future.
3. **Money measurement Postulate:** A unit of exchange and measurement is necessary to account for the transactions of business enterprises in a uniform manner. The common denominator chosen in accounting is the monetary unit.
4. **Accounting Period Postulate:** Financial accounting provides information about the economic activities of an enterprise for specified time periods that are shorter than the life of the enterprise. Normally the time periods are of equal length to facilitate comparison.

Accounting Concepts and Principles

1. **Cost Principle:** The cost principle requires that assets be recorded at the exchange price, i.e. acquisition cost or historical cost. Historical cost is recognized as the appropriate valuation basis for recognition of the acquisition of all goods and services, expenses, costs and equities.
2. **Dual-Aspect Principle:** This principle lies at the heart of the whole accounting process. Accounts recording systems have therefore developed so as to show two main things; (a) the source of wealth, and (b) the form it takes.
3. **Accrual Principle:** Accrual accounting is based not only on cash transactions but also on credit transactions, barter exchanges, changes in prices, changes in the form of assets or liabilities, and other transactions, events, and circumstances that have cash consequences for an enterprise but involve no concurrent cash movement.
4. **Conservatism Principles:** The concept of accounting conservatism suggests that when and where uncertainty and risk exposure so warrant, accounting takes a wary and watchful stance until the appearance of evidence to the contrary.

5. **Matching Principle:** The matching principle in financial accounting is the process of matching (relating) accomplishments or revenues (as measured by the selling prices of goods and services delivered) with efforts or expenses (as measured by the cost of goods and services used) to a particular period for which the income is being determined.
6. **Consistency Principle:** This principle requires that once an organization has decided on one method, it should use the same method for all subsequent transactions and events of the same nature unless it has sound reason to change methods.
7. **Materiality Principle:** Materiality concept implies that the transactions and events that have immaterial or insignificant effects should not be recorded and reported in the financial statements. It is argued that the recording of insignificant events cannot be justified in terms of its subsequent poor utility to users.
8. **Full disclosure principle:** The principle of full disclosure requires that a business enterprise should provide all relevant information to external users for the purpose of sound economic decisions.

Basic Accounting Equation Or Model

The framework of the financial statements and the elements shown in these statements rests on important and basic relationship, referred to as basic or fundamental accounting equation or basic accounting model. This basic equation is expressed by the balance sheet equation, and therefore, is known as the balance sheet equation also. The balance sheet equation indicates that

Sources of Funds = Uses of Funds (Or) Equities = Assets

(Or) Proprietor's Equity (Capital) + outside Liability = Assets

The above accounting equation signifies that assets of a business are always equal to the total of outside liabilities and proprietor's equity.

Example:

On January 1, 1999, a company Super Consultants India Ltd. Was incorporated. The following transactions occurred during January 1999.

January

1. Business was started with capital of Rs. 10,000 cash.
- 4 Equipment was rented (and paid) for the month at a cost of Rs. 1,200.
- 8 Paper stationery purchased on credit Rs. 800.
15. The company charged Rs. 3,000 as consulting fees from the customers during January. This amount is due to be received next month.
20. Miscellaneous expense of Rs. 600 were paid.
29. Land was purchased by borrowing Rs. 40,000 from a bank
The loan is due to be repaid in five years. Interest payments are due at the end of each money beginning July 31.
30. Salaries of Rs.700 for the month were paid.
31. Lesson fees were billed to customers in the amount of Rs. 2,800.
(They are due to be received next month).

Prepare a summary of the preceding transactions. Determine balances after each transaction to show that the basic equation is in balance.

Prepare an income statement, a statement of retained earnings, balance sheet for January 1999.

Solution: SUPER CONSULTANT INDIA LTD.*SUMMARY OF TRANSACTIONS,**January 1999*

Date	Assets			=	Liabilities	+	Equity
	Cash	+ Accounts Receivables	+ Land	=	A/cs payables	+ Loan	Capital + Profit or Retained Earning
1	10,000			=			10,000
4	- 1,200						-1,200
	8,800						10,000 - 1,200
8				= +800			- 800
	8,800				800		10,000 - 2,000
15		+3,000		=			+3,000
	8,800	3,000			800		10,000 +1,000
20	- 600			=			- 600
	8,200	3,000			800		10,000 + 400
29			+ 40,000	=		+ 40,000	
	8,200	3,000	40,000	=	800	40,000	10,000 + 400

30	-700							-700
	7,500	3,000	40,000	=	800	40,000	10,000	- 300
31		+ 2,800						+ 2,800
	7,500	5,800	40,000	=	800	40,000	10,000	2,500

INCOME STATEMENT FOR THE MONTH ENDED JANUARY 31, 1999

Revenues:	(Rs.)
Consulting fees	3,000
Lesson Fees	2,800
	<hr/>
Total Revenues	5,800
	<hr/>
Less: Expenses	
Rent expense	1,200
Paper & Stationery	800
Salaries	700
Misc. expenses	600
	<hr/>
	3,300
	<hr/>
Net Income	2,500
	<hr/>

STATEMENT OF RETAINED EARNINGS

Retained earnings as on January 1...	NIL
Add: Net Income for January	2,500
	<hr/>
Total	2,500
Less= dividends	NIL
	<hr/>
Retained earnings, January 31	2,500
	<hr/>

Accounting Records

Accounting is based on a double-entry system, which means that we record the dual effects of a business transaction. Each transaction affects at least two accounts. For

example, an owner's cash investment in the business increases both the Cash account and the Capital account of the business. It would be incomplete to record only the increase in the entity's cash without recording the increase in its owner's equity.

Consider a cash purchase of supplies. What are the dual effects of this transaction? The purchase (1) decreases cash and (2) increases supplies. A purchase of supplies on credit (1) increases supplies and (2) increases creditors. All transactions have at least two effects on the entity.

The T-Account

The most widely used account format is called the T-account because it takes the form of the capital letter "T." The vertical line in the T-account divides the account into its left and right sides. The account title rests on the horizontal line. For example, the Cash account of a business appears in the following T-account format:

CASH		
(Left side) Debit		(Right side) Credit

The left side of the account is called the debit side, and the right side is called the credit side. Debit and credit are abbreviated as follows:

Dr = Debit

Cr = Credit

The account category determines how increases and decreases in it are recorded. For any given account, all increases are recorded on one side, and all decreases are recorded on the other side.

Rules of Debit and Credit

Increases in assets are recorded on the left (debit) side of the account.

Decreases in assets are recorded on the right (credit) side.

Conversely,

Increases in liabilities and owner's equity are recorded by credits.

Decreases in liabilities and owner's equity are recorded by debits.

Whether an account is increased or decreased by a debit or a credit depends on the type of account. This pattern of recording debits and credits is based on the accounting equation:

Assets = Liabilities + Owner's Equity

Debits = Credits

Assets are on the opposite side of the equation from liabilities and owner's equity. Therefore, increases and decreases in assets are recorded in the opposite manner from those in liabilities and owner's equity. And liabilities and owner's equity, which are on the same side of the equal sign, are treated in the same way.

Cash Book

This records all receipts of and payments in cash. Usually the deposits into bank accounts maintained by the business, withdrawals from such accounts and cheque payments are also recorded in the Cash Book. Sometimes a separate book for recording receipts and payments by cheques/DDs etc., is kept, known as the Bank Book. A Cash Book which is used to record both cash and bank transactions is referred to as a Two-column Cash Book. The format of this cash book is given below:

Table 7.1 Cash book

Date	Receipts	Cash (Rs.)	Bank (Rs.)	Date	Payments	Cash (Rs.)	Bank (Rs.)
2000 April 1	To Balance b/d	1,500	13,000	2000 April 2	By wages	50	
6	To Sales	800		5	By electricity		400
7	To Arvind Co		2,000	8	By Plumbing	400	
11	To Bela Corporation		2,350	15	repairs		10,800
20	To Sales	500		30		2,350	6,150
		2,800				2,800	17,350

Journal

The Books of Accounts maintained by an organization other than the cash book may be classified into Journals and Ledgers. The Journal is used as the book of first entry for all transactions which cannot be recorded in the Cash Book. In other words, all non-cash transactions should be recorded in the journal. For practical convenience the journal is maintained by using a number of books called the subsidiary books. For example, the following subsidiary books may constitute the journal for an enterprise.

- (i) Purchase Book
- (ii) Purchase Returns Book
- (iii) Sales Book
- (iv) Sales Returns Book
- (v) Bill Receivable Book
- (vi) Bills Payable Book
- (vii) Journal Proper

Specimen formats of these books and brief explanations regarding their use are given in the following sections.

Purchases book

Also known as the purchases Journal, this book is used to record credit purchases of goods only. The term 'goods' covers only those items procured by the business for resale.

Table 7.2 Purchase Book of Johnson Co.

Date	Name of Supplier	Ledger Folio	Inward Invoiced No.	Amount Rs.
2000 April 2	Y Limited		3354	10,950
12	Sharp Enterprises		401	2,700
20	Best and Company		5542	3,900
	Total			17,550

Purchase Returns Books

This subsidiary book is used to record the goods purchased on credit and sent back to suppliers as they are found not conforming to specifications or for any other reason.

Table 7.3 Purchase Returns Book of Johnson Co.

Date	Name of Supplier	Ledger Folio	Debit Note No	Amount (Rs.)
2000 April 5	Sharp Enterprises		80	1,000
25	Best and Company		81	900
	Total			1,900

Sales Book

Also known as the Sales Journal, this subsidiary book is used to record all sales of goods on credit.

Table 7.4 Sales book

Date	Name of Supplier	Ledger Folio	Outward Invoice No.	Amount (Rs.)
2000				
April 3	Beta Corporation		1001	2,410
5	Zeta Company		1002	3,940
6	Quality Dealers		1003	4,990
15	Sooraj Traders		1004	1,800
25	Star Enterprises		1005	19,500
	Total			32,550

Sales Returns Book

This book is used to record the transactions relating to goods sold on credit and received back from the customers as not conforming to the specifications or for any other reason.

Table 7.5 Sales Returns Book

Date	Name of Customer	Ledger Folio	Credit No	Note	Amount (Rs.)
2000					
April 10	Company		10		540
27	Star Enterprises		11		2,000
	Total				2,540

Bills Receivable Book

The bills Receivable of an enterprise consists of all Promissory Notes is given by customer our Bills of Exchange accepted by customers in respect of amounts due from them the bills Receivable Book is used to record all such promissory Notes given or such bills of Exchange accepted by customers.

Table 7.5 Bills Receivable Book of Johnson Co

Date	From Whom reced.	Acceptor	Date of bills	Term	Date of maturity	Where payable	Amount. (Rs.)	How Disposed
April	Quality	Quality	8.4.95	90	10.7.95	Bank of	4,900	Discounted

12	<i>Dealers</i>	<i>Dealers</i>		<i>days</i>		<i>India</i>		<i>on 20.4.95</i>
18	<i>Sooraj Traders</i>	<i>Sooraj Trader</i>	<i>16.04.95</i>	<i>60 days</i>	<i>10.6.95</i>	<i>Central Bank of India, New Delhi</i>	<i>1,800</i>	
							<i>6,700</i>	

Bills Payable Book

The Bills Payable consists of all Promissory Notes given or Bills of Exchange accepted by the business in respect of amounts owing to its suppliers. The Bills Payable Book is used to record all such Promissory Notes given or Bills of Exchange accepted by the business

Table 7.6 Bills Payable Book of Johnson Co

<i>N</i>	<i>Date</i>	<i>Name of the drawer</i>	<i>Payee</i>	<i>Date of Bills</i>	<i>Term</i>	<i>Date of maturity</i>	<i>Where payable</i>	<i>Amount.</i>	<i>Remark</i>
<i>1995</i>	<i>April 25</i>	<i>Best & Co.</i>	<i>Best & Co.</i>	<i>25.4.95</i>	<i>92 Days</i>	<i>27.7.95</i>	<i>Canara Bank, Bombay</i>	<i>3,000</i>	

Journal Proper

This Book is used to record all transactions which cannot be included in the cash book or any of the other six subsidiary books, discussed above. The transactions that will be recorded in Journal Proper are, purchase or sale of fixed assets and investments on credit, adjusting entries, rectification entries etc.

Table 7.7 Journal Proper

<i>Date</i>	<i>Particulars</i>	<i>Ref.</i>	<i>Ledger Folio</i>	<i>Debit (Rs.)</i>	<i>Credit (Rs.)</i>
<i>April 10</i>	<i>Furniture and Fitting A/c</i> <i>Dr.</i> <i>To Furniture Mart A/c</i> <i>(being the purchase of furniture on credit)</i>			<i>4,000</i>	<i>4000</i>

April 30	<i>Repairs to machinery A/c Dr. To Machinery A/c (being the rectification of a wrong posting of a repair expense to asset (A/c)</i>		5,000	5,000
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Ledger

An accounting system typically contains a large number of accounts. Collectively these individual account are contained in a record know as the ledger. A ledger is simply the grouping of the accounts that are used to prepare financial statements for a business. A ledger account is a summary device and its simplest form is shaped like the letter and called a T account

Relationship between Journal and Ledger

Journal and ledger are the most important books maintained in an enterprise. They are closely interrelated. Business transactions are recorded first in Journal and other books of original entry and then from these books that are transferred to ledger. Journal records transaction in a chronological order while the ledger records the transactions in a classified form.

Posting

Posting is a process of transferring debits and credits from the Journal and other books of original entry to their respective account in the ledger. The aim of posting is to make a classified and summarized record of business transactions in appropriate accounts.

Posting Of Different Account Books:

Cash book

Rules regarding posting of cash book are given below:

- (i) Transactions recorded on the debit side of Cash Book are posted on the credit side of accounts opened in the ledger.
- (ii) Transactions recorded on the credit side of the cash book are posted on the debit side of different account in the ledger.

Purchase Book

In purchases Books, credit purchases of goods in which the enterprises deals are recorded. Accounts of all those persons who have supplied goods are to be opened and credited with the amount of purchase made from the. Total of purchases book is to be posted on the debit side of purchases account. This is illustrated below:

Harish Jain, Delhi

Dr.

Cr.

		Rs.			Rs.
			1.6.94	By Purchase a/c	10,000

Summant Prasad

Dr.

		Rs.			Rs.
			31.5.94	By Purchase a/c	20,000

Purchased a/c

Dr.

Cr.

		Rs.			Rs.
			1.6.94	To Sundries a/c	30,000

Purchase Return Book

Purchases Return Book, also called Returns Outward Book, records returns of Purchase made to suppliers. Personal accounts of all these persons to whom goods have returned are debited and total of purchase returns book is credited to purchase returns account as illustrated below

Harish Jain, Delhi

Dr.

Cr.

		Rs.			Rs.
15.7.94	To Purchases Return a/c	1,000	1-7-94	By Purchases a/c	10,000

Summant Prasad

Dr.

Cr.

		Rs.			Rs.
20-6-94	To Purchase return a/c	3,000	31.5.94	By Purchases a/c	20,000

Purchase Returns a/c

Dr.

Cr.

		Rs.			Rs.
			31.7.94	By Sundries	4,000

Sales Book

Sales Book records all credit sales. While posting Sales Book to ledger, Personal accounts of the customers are opened and debited by the amount of sales made to them total of Sakes us redited to Sales account. This is illustrated below.

Ram Pershad

		Rs.			Rs.
2.7.94	To Sale a/c	15,000			

Devi Prasad

		Rs.			Rs.
25.6.94	To Sales a/c	20,000			

Sales A/c

		Rs.			Rs
			31.7.94	By Sundries	15,000

Sales Returns Book/Returns Inward Book

When goods are returned by customer they are recorded in sales returns book/returns inward book. While posting Sales Returns book to Ledger, personal accounts of the customer are credited and total of Sales Returns Book is debited to Sakes returns a/c. this is illustrated below:

Ram Prashad

Dr.

Cr.

		Rs.			Rs.
--	--	-----	--	--	-----

2.7.94	To Sales a/c	15,000	14.7.94	By Sales returns a/c	4,000
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Devi Dass*Dr.**Cr.*

		Rs.			Rs.
25.6.94	To Sales a/c	20,000	10.7.94	By Sales return a/c	4,000

Sales A/c*Dr.**Cr.*

		Rs.			Rs.
15.7.94	To Sundries	8,000			

Bills Receivable Book

In bills receivable book, bills received by the enterprise are recorded. While posting Bills receivable book, Personal accounts of the persons giving the bills are credited. Total of Bills Receivable book is debited to Bills Receivable a/c

Sunder Kumar*Dr.**Cr.*

		Rs.	1994		Rs.
			July 10	By B/R a/c	10,000

Suresh Chander*Dr.**Cr.*

		Rs.	1994		Rs.
			July 7	By B/R	15,000

Bill Receivables a/c*Dr.**Cr.*

		Rs.			Rs.
15.7.94	To Sundries	25,000			

Bills Payable Book

The enterprise may accept so many bills in the business. Acceptances given are recorded in Bills payable book. While posting Bills payable Book acceptances given are debited to the personal accounts of the persons to whom they have been given and total of Bills Payable book is posted to the credit side of Bills payable a/c. This is illustrated below:

Ram Prasad

<i>Dr.</i>		Rs.			Rs.	<i>Cr.</i>
2.7.94	To B/P	8,000				

Chandra Mohan

<i>Dr.</i>		Rs.			Rs.	<i>Cr.</i>
10.7.94	To B/p a/c	7,000				

<i>Dr.</i>		Rs.			Rs.	<i>Cr.</i>
			15.7.94	By Sundries	15,000	

Posting Of Journal

When we journalize a transaction we write out in the journal as to which account is to be debited and which account is to be credited. The same information is transferred to Ledger in the two concerned accounts. This is illustrated below:

Table 7.8 Posting of Journal

	Particulars		Rs.	Rs.
	Furniture a/c		70,000	70,000
<i>Dr.</i>	To Jain & Co.			
	(Being furniture bought from Jain & Co. on Credit)		7,000	7,000
	Depreciation a/c			
<i>Dr.</i>	To Furniture a/c			

Furniture a/c

<i>Dr.</i>		Rs.			Rs.	<i>Cr.</i>
	To Jain & Co.	70,000	By depreciation a/c		7,000	

Depreciation a/c

<i>Dr.</i>		Rs.			Rs.	<i>Cr.</i>
	To Furniture a/c	7,000				

Jain & Co.

<i>Dr.</i>		Rs.			Rs.	<i>Cr.</i>

		To Furniture a/c	70,000
--	--	------------------	--------

Balancing of an Account

Balancing of an account implies a process of ascertain the net balance of an account after considering and comparing the total of both sides-viz debit side and credit side. The Balance is put on the side which is smaller and the two totals-debit side and credit side. The Balance is put on the side which is smaller and the two totals-debit side and credit side are made equal. Against the balance a reference is put that is has been carried forward (C/F). The balance of an account will be termed as debit balance if the total of debit side is greater than the total of credit side. On the other hand, if total of credit side is greater than total of debit side, balance will be a credit balance. This is illustrated below:

Mohan

Table 7.9 Balancing of an Account

		Rs.			Rs.
5.5.94	To B/p a/c	7,000	1.5.94	By purchase a/c	15,000
6.5.94	To purchase returns	2,000	16.5.94	By purchase a/c	25,000
17.5.94	To Bank a/c	15,000			
31.5.94	To Balance c/d	16,000			
		40,000			40,000
				By balance b/d	16,000

Furniture a/c

		Rs.			Rs.
1.5.94	To Bank a/c	16,000	31.5.94	By balance c/d	16,000
		16,000			16,000
1.6.94	To Balance b/d	16,000			

Trial Balance

When all accounts of the ledger are in balance, a Trial Balance is prepared. A Trial Balance is a listing of all the accounts and their respective balances. Trial balance is

a statement of debit balances and credit balance extracted from ledger accounts on a particular date. A Trial Balance is, thus, a summary of all the ledger balances outstanding as on a particular date.

Performa of a Trial Balance is as follows:

Trial Balance as at....

Ledger accounts	Debit Balance	Credit Balance
-----------------	---------------	----------------

It must be stated here that total of debit balance column must be equal to total of credit balances column. This is so because under double entry system, for each item of debit there is a corresponding credit and secondly all the transactions recorded in the books of original entry are transferred to ledger.

Objectives of Preparing a Trial Balance

The following are the objectives of preparing a Trial Balance:

1. To check the
2. Arithmetical accuracy of accounting entries posted in the ledger- When the trail balances tallies, it is an indication of the fact that ledger accounts are arithmetically accurate. It also indicates that: (i) For each transaction, the debits and credits were recorded in equal amounts. (ii) The balance (debit balances and credit balance)for each account was calculated correctly. (iii) The balances of the various debit and credit accounts have been correctly added together to arrive at the total equality of the debit and credits. Of course there may be certain errors in the books of accounts inspite of the agreement of Trial Balance. These have been discussed later in a subsequent chapter.
3. To Provide a Basic for Financial statement- Trial Balance is a first step towards preparation of financial statement of an organization. If trail balance is not prepared, it will be impossible to prepare the financial statement.
4. Trial Balance serves as a summary of all the ledger accounts and provides a complete picture of each account in the ledger.

Example

During January 1999, Anil Kumar transacted the following business. You are required to make journal entries for the transactions and prepare cash book and other necessary ledger accounts based on the journal entries.

January 1999		
1	Commenced business with cash	20,000
2	Purchased goods on credit from Shyam	15,000
3	Purchased goods for cash	500
4	Paid Gopal an advance for goods ordered	1,000
5	Received cash from Muthy as advance for goods ordered by him	1,500
6	Purchased furniture for office use for cash	1,000
7	Paid wages	250
8	Received commission (in cash)	300
9	Goods returned to Shyam	100
10	Goods sold to kamal	5,000
11	Paid for postage and telegrams	100
12	Goods returned by kamal	250
15	Paid for Stationery	100
18	Paid into bank	250
20	Good sold for cash	375
22	Bought goods for cash	500
25	Paid salaries	350
28	Paid rent	250
31	Drew cash for personal use	500

Table 7.10 Solution

Date	Particulars	L.F	Debit (Rs.)	Credit (Rs)
1999 Jan.1	Cash account Dr. To Capital account (Being the cash brought into business as capital)		20,000	20,000
Jan. 2	Purchase account Dr To Shyam's account (Being the goods purchased on credit)		15,000	15,000
Jan 3	Purchase account Dr To Cash account		500	500

	(Being the goods purchased for cash)			
Jan 4	Gopal Dr To Cash account (Being the amount paid to Gopal)	account	1,000	1,000
Jan 5	Cash Dr To Murthy account (Being the cash received from Murthy)	account	1,500	1,500
Jan 6	Furniture Dr To cash account (Being the furniture purchased for office use for cash)	account	1,000	1,000
Jan 7	Wages Dr To cash account (Being the wages paid)	account	250	250
Jan 8	Cash Dr To commission received a/c (Being the commission received)	account	300	300
Jan 9	Shyam Dr To purchase returns account (Being goods returned to shyam)	account	100	100
Jan 10	Kamal Dr To sales account (Being goods sold to kamal on credit)	account	5,000	5,000
Jan. 11	Postage and telegrams Dr To Cash account (Being the goods returned by kamal)	account	100	100
Jan 12	Sales returns account To Kamal account (Being the goods returned by kamal)	Dr	250	250
Jan.15	Stationary Dr To cash account (Being the amount paid for stationary)	account	100	100
Jan 18	Bank account To cash account (Being the amount deposited in to the bank)	Dr	250	250
Jan 20	Cash account To sales account	Dr	475	

	(Being the goods sold for cash)			475
Jan 22	Purchase account To cash account (Being the goods purchased for cash)	Dr	500	500
Jan 25	Salaries account To cash account (Being the amount paid as salaries	Dr	350	350
Jan 28	Rent account To cash account (Being the rent paid)	Dr	250	250
Jan 31	Drawings account To cash account (Being the cash drawn for personal use)	Dr	500	500

LEDGER ACCOUNTS

Table 7.11 Cash Book

Dr					Cr				
Date	Receipts	Ledger Folio	Cash (Rs.)	Bank (Rs)	Date	Payments	Ledger Folio	Cash (Rs.)	Bank (Rs)
1999					1999				
Jan.1	To capital a/c		20,000		Jan.3	By Purchase a/c		500	
Jan.5	To Murthy a/c		1,500		Jan.4	By Gopal a/c		1,000	
Jan.8	To commission a/c		300		Jan.6	By Furniture a/c		1,000	
Jan.18	To cash a/c	C		250	Jan.7	By wages a/c		250	
Jan.20	To sales a/c		375		Jan.12	By postage & telegrams		100	
					Jan.15	By stationery a/c		100	
					Jan.18	By bank a/c	C	250	
					Jan.22	By purchase a/c		500	
					Jan.25	By salaries a/c		350	
					Jan.28	By rent a/c		250	
					Jan.31	By drawings a/c		500	
					Jan.31	By balance c/d		17,375	250
			22,175	250				22,175	250

Note : The letter 'C' in the Ledger Folio column denotes a contra entry. This is an entry for which the debit and credit aspects are found in the cash book itself.

Purchase Book

Dr.				Cr.	
Date	Name of supplier	Ledger No	Folio	Inward Invoice	Amount (Rs.)
1999 Jan.2	Shyam				15,000

			Total	15,000
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Purchase Returns Book

Date	Name of supplier	Ledger No	Folio	Inward Invoice	Amount (Rs.)
1999 Jan 9	Shyam				100
				Total	100

Sales Book

Date	Name of supplier	Ledger No	Folio	Inward Invoice	Amount (Rs.)
1999 Jan.10	Kamal				5,000
				Total	5,000

Sales Returns Book

Date	Name of supplier	Ledger No	Folio	Inward Invoice	Amount (Rs.)
1999 Jan.13	Kamal				250
				Total	250

GENERAL LEDGER

Capital Account

Date		Rs.	Date		Rs.
1999 Jan.31	To balance c/d	20,000	1999 Jan. 1	By cash a/c	20,000
		20,000			20,000
			Feb.1	By balance b/d	20,000

Shyam's Account

Date		Rs.	Date		Rs.
1999 Jan.9	To Purchase	100	1999 Jan.2	By purchase a/c	15,000
Jan.31	returns	14,900			15,000
	To balance c/d	15,000	Feb.1	By balance b/f	14,900

Purchase Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999			1999		
Jan.2	To Shyam a/c	15,000	Jan.31	By balance c/d	16,000
Jan.3	To cash	500			
Jan.22	To cash	500			
Feb.1	By balance b/d	16,000			16,000
		16,000			16,000

Sales Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999			1999		
Jan.31	To balance c/d	5,375	Jan.13	By Kamal a/c	5,000
			Jan.20	By cash	375
		5,375			5,375
			Feb.1	By balance b/d	5,375

Purchase Returns Accounts

Dr			Cr.		
Date		Rs.	Date		Rs.
1999			1999		
Jan.31	To balance c/d	100	Jan.9	By Shayam a/c	100
		100			100
			Feb.1	By balance b/d	100

Sales Returns Account

Dr			Cr		
Date		Rs.	Date		Rs.
1999			1999		
Jan 13	To Kamal a/c	250	Jan.31	By balance	250
Feb.1	To balance b/d	250			250
		250			

Gopal's Accounts

Dr			Cr.		
Date		Rs.	Date		Rs.
		1,000			1,000

Feb.1	To balance b/d	1,000			1,000
		1,000			

Wages Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999 Jan 6	To Cash a/c	250	1999 Jan.31	By balance c/d	250
		250			250
Feb.1	To balance b/d	250			

Commission Received Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999 Jan 13	To balance c/d	300	1999 Jan.8	By cash a/c	300
		300			300
			Feb.1	By balance b/d	300

Kamal's Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999 Jan.10	To sales a/c	5,000	1999 Jan.31	By Sales returns	250
		5,000	Jan.31	a/c	4,750
Feb.1		4,750		By Balance c/d	5,000

Postage and Telegrams Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999 Jan.10	To cash a/c	100	1999 Jan.31	By Balance c/d	100
		100			100
Feb.1	To balance b/d	100			

Stationary Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999 Jan.10	To cash a/c	100	1999 Jan.31	By Balance c/d	100
		100			100
Feb.1	To balance b/d	100			

Salaries Account

Dr			Cr.		
Date		Rs.	Date		Rs.

1999 Jan.10	To cash a/c	350	1999 Jan.31	By Balance c/d	350
		350			350
Feb.1	To balance b/d	350			

Rent Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999 Jan.10	To cash a/c	250	1999 Jan.31	By Balance c/d	250
		250			250
Feb.1	To balance b/d	250			

Drawing Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999 Jan.10	To cash a/c	500	1999 Jan.31	By Balance c/d	500
		500			
Feb.1	To balance b/d	500			

Murthy's Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999 Jan.10	To balance b/d	1,500	1999 Jan.5		1,500
		1,500			1,500
Feb.1			Feb.1	By Balance c/d	1,500

Furniture Account

Dr			Cr.		
Date		Rs.	Date		Rs.
1999 Jan.10	To cash a/c	1,000	1999 Jan.31	By Balance c/d	1,000
		1,000			1,000
Feb.1	To balance b/d	1,000			

7.2 Preparation of Financial Statements: Profit and Loss Account and Balance Sheet

Trial Balance is first step towards preparation of financial statement namely trading and Profit and Loss Account and Balance Sheet. Trading and Profit and Loss Account are prepared in order to determine the income earned or loss incurred during the accounting period. Balance Sheet indicates the financial position of the enterprise. However, before

preparing trading account, profit and loss account and balance sheet, certain adjustment entries are required.

Adjustment Entries

As stated earlier, financial accounting uses accrual basis of accounting which is supported by Generally Accepted Accounting Principle (GAAP). Under accrual basis of accounting.

1. Revenues are recognized when earned, without regard to the timing of cash receipts.
2. Expenses are recognized either (a) in the period in which related revenues are recognized or (b) when incurred, without regard to the timing of cash disbursement.

When the accrual basis of accounting is used, adjusting entries are required at the end of the period to record any previously unrecognized changes in assets, liabilities, revenues, or expenses. Adjusting entries are made to modify certain account balances at the end of the accounting period so that they will reflect fairly the situation as of the end of the period.

Generally, four general types of adjustment (adjusting entries) are needed at the end of the accounting period prior to the preparation of financial statements:

1. Reflecting unrecorded revenue earned during the accounting period.
2. Reflecting unrecorded expenses incurred during the accounting period.
3. Reflecting or aligning recorded costs with the appropriate accounting periods i.e. considering expenditures benefiting more than one accounting period.
4. Reflecting or aligning recorded revenue with the appropriate accounting period i.e. considering revenues received in advance.

Adjustment in the first two categories- unrecorded revenues and unrecorded expenses =- are referred to as accruals such as salaries and wages incurred but not paid, interest earned but not received. Adjustments in the last two categories – reflecting recorded costs and revenues with the appropriate periods- are referred to as deferrals such as prepaid expenses, unearned revenue and depreciation.

Adjusting entries have following features:

1. Every adjusting entry affects both the profit and loss account and the balance sheet.
2. Adjusting entries do not directly affect the cash account.
3. They are generally recorded at the end of the accounting period.
4. A profit and loss account balance (revenue or expense) is changed.
5. A balance sheet account balance (asset or liability) is changed.

Types of Adjusting Entries

The different items or situations which are subject to adjusting entries before preparing financial statements are explained below:

1. **Closing Inventory:** Under the periodic verification method, the closing inventory of every item is arrived at by physically counting the inventory available and assigning a value to the same. In concerns adopting the periodic verification method, the value of closing inventory will be brought into the books of account through the following journal entry:

Closing inventory A/c	Dr.
To Trading A/c	

While the closing inventory appears on the credit side of the trading account to reduce the cost of goods sold, it also appears as an asset in the Balance Sheet.

2. **Outstanding or Accrued Expense:** The nominal accounts record the actual expense paid during the accounting period. However, prior to the preparation for the financial statements, it must be ensured that all expenses which have fallen due to be paid but which have not been paid during the accounting period are also brought into the books to help in the proper matching of revenues and expenses. For example, ABC Trading Company had the practice of paying the salaries of the employees of 4th of the subsequent month. During the financial year ending 31st March 1995 the salaries account shows a debit balance of Rs.55, 000. The salaries of Rs.6, 000 pertaining to March 1995 were paid on 4th April. 1995. While preparing the financial statements for the year ending 31st March, 1995, the salaries of Rs. 6,000 of March must also be included. This is done with following adjusting journal entry:

Salaries A/c	Dr.	Rs. 6,000
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To Outstanding Salaries A/c Rs. 6,000

The above journal entry increase the salaries to the correct amount of Rs. 61,000 and the Outstanding salaries of Rs. 6,000 will be shown as a liability in the Balance Sheet.

The adjusting journal entry to record any outstanding expense is

Expense A/c Dr.

To Outstanding Expense A/c

While the amount of expense taken from the Trial Balance will be increased by the amount Outstanding and shown in the Trading and Profit and Loss Account, the actual amount outstanding will be shown as a liability in the Balance Sheet. In the subsequent accounting period, the outstanding expense liability will be transferred to the expense or nominal account and will be set off by the entry of actual payments when it is made.

3. **Prepaid Expense:** Certain expenses paid may relate to more than one accounting period. In such cases, it is necessary to identify the portion of the expenditure for which the benefit is yet to be received by the concern and treat that part of the expenditure as prepaid.

ABC Trading Company took an insurance cover for all assets against fire on 1st October 1994 and paid the annual premium of Rs. 2,400 on the same day. Since the benefit of the entire expenditure will expire only on 30th September, 1995, it is necessary to recognize this aspect while preparing the financial statements as on 31st March, 1995.

The amount of expense prepaid on 1st October, 1994 = $(1/2 \times 2,400 = \text{Rs. } 1,200)$.

The adjusting entry to record the prepaid insurance is

Prepaid Insurance A/c Dr. Rs. 1,200

To Insurance A/c Rs. 1,200

This ensures that the insurance expense is reported at the correct figure of Rs. 1,200 in the profit and loss account and the prepaid amount is shown as an asset in the balance sheet.

The journal entry to record any prepaid expense is,

Prepaid Expense A/c

To Expense A/c

In the subsequent accounting period, the balance in the prepaid expense account will be transferred back to the expense account.

4. **Outstanding Accrued Income:** An income appearing in the ledger account may not represent the income that must have been received during the year. If a portion of an income has not yet been received or is outstanding as at the end of the accounting period then the outstanding amount must be brought into books.

ABC Trading Company would have received the interest of Rs. 350 $[5,000 \times (14/100) \times 1/2]$ during the accounting period ending 31st march, 1993, the interest of Rs. 350 for the next six months will be received only in the subsequent accounting period. However, while preparing the financial statements, the total interest revenue to be recognized is the amount of Rs. 350 actually received plus the interest of Rs. 175 pertaining to the period 1st January, 1993 to 31st March, 1993.

The following adjusting entry will bring into books the amount of outstanding interest:

Outstanding Income A/c	Dr.	Rs. 175
To Interest Received A/c		Rs. 175

While the interest received will be increased to Rs. 525 and shown in the profit and loss account, the outstanding interest account will be listed as an asset in the Balance Sheet.

In the subsequent accounting period, the amount in the outstanding interest A/c will be transferred to interest received A/c and the actual receipt of the interest will offset the former transfer entry.

Outstanding Income A/c	Dr.
To Income A/c	

5. **Income Received in Advance:** While preparing the financial statements, adjustments may be necessary in respect of any incomes received in advance. Assume a Law publication has received subscriptions amounting to Rs. 50,000 during the financial year ending 31st December, 1992. Out of this, Rs. 2,500 represents subscriptions relating to the next financial year.

The entry to adjust for the income received in advance will be,

Subscription A/c	Dr.	Rs. 2,500
To Subscription received in Advance		Rs. 2,500

With the posting of the above journal entry, the subscriptions account will be shown in the profit and loss account at the credit figure of Rs. 47,500 and in the balance sheet, the subscriptions received in advance as a liability. Any income received in advance is a liability as benefits are yet to be conferred to the person from whom the amount has been received. The journal entry to record the adjustment of any income received in advance is

Income A/c	Dr.
To Income Received in Advance A/c	

6. **Depreciation:** Depreciation is the acquisition cost of an asset (less the expected salvage value) spread over the economic life of that asset. The purpose of charging depreciation over the economic life of the asset is to match the cost of the asset over the period for which the revenue is earned by using the asset.

Preparing Profit And Loss Account

From a given trial balance, we can prepare a Profit and Loss account to determine the profit and loss made by a business firm during a particular period. At the time of preparation of profit and loss account, the following point may be kept in mind:

All expenses are debited to Profit and Loss Account

All incomes are credited to Profit and Loss Account

Further, we may have to give special treatment to certain adjustment also (discussed in detail earlier in the chapter)

Balance Sheet

A balance sheet, also commonly referred to as a statement of financial positions, is a statement of assets and liabilities of business enterprises at a particular date. The balance sheet summarizes and reveals the financial position of enterprises on a particular date, by showing what it owns and what it owes. Because the balance sheet is a snap shot of an instant in time, it is a status report rather than flow report.

The balance sheet is a fundamental or first accounting statement in the sense that every accounting transaction can be analyzed in terms of its dual impact on the balance sheet. Moreover, most often, revenues and expenses are defined in terms of changes in assets and liabilities. Thus, a thorough understanding of the nature and measurement of assets and liabilities is needed to understand net income and its component. A Balance Sheet has no debit and credit side. It is prepared on a particular date and as such, it shows the assets and liabilities of business enterprises on that date. Even a single transaction will cause a change in the assets and liabilities of the enterprises as shown in the Balance Sheet. Therefore, it is true only for the date on which it has been prepared. It is called a Balance sheet because it is actually a sheet containing balances of ledger accounts which have not been closed by transfer to trading and profit and loss a/c.

Arrangement of Assets and Liabilities Items On The Balance Sheet

In the case of a company, The Companies Act 1956 provides that balance sheet should be prepared as per schedule VI given therein and assets and liabilities should be written in the sequence (or order) shown in the Schedule. However, in the case of sole proprietorship, and partnership, no rule is provided for recording assets and liabilities on the balance sheet.

Example

On 31.12.1999 the following Trial Balance was prepared from the books of Raju:

	Dr. (Rs)	C. (Rs)
Sundry Debtors	50,600	10,000
Sundry Creditors	-	-
Bills Receivable	5,000	-
Plant & Machinery	75,000	-
Purchases	90,000	70,000
Capital	-	-
Freehold Premises	50,000	-
Salaries	11,000	-
Wages	14,400	-
Postage and Stationary	750	-
Carriage In	750	-
Carriage Out	1,000	-
Bad debts	950	-
Bad Debts Provisions	-	1,000
General Charges	1,500	-
Cash at Bank	5,300	-
Cash in Hand	800	-

Bills Payable	-	5,000
Reserve	-	20,000
Sales	-	2,31,700
Closing Stock	29,,300	-
	3,37,050	3,37,500

The following adjustments are required:

- (1) Raju gets a salary of Rs. 9,000 p.a
- (2) Allow 5% interest on capital
- (3) Bad debts provision to be adjusted to 21/2% on sundry debtors.
- (4) 21/2% of the net profit to be credited to Reserve.
- (5) It was discovered in January 1999 that stock sheets as on 31.12.1998 were overcast by Rs 1,000.

You are required to prepare Trading and Profit and Loss account for the year ended 31st December, 1999 and a balance Sheet as at that date.

Solutions:

Table 7.12 Trading and Profit and Loss A/c for the year ending 31st December, 1999

		Rs.		Rs.
To Purchases	90,000		By Sale	2,31,700
Less: Overcast stock	1,000	89,000		
To Wages		14,400		
To Carriage inward		750		
To gross profit		1,27,550		
		2,31,700		
			By Gross Sales	2,31,000
To Salaries	11,000			1,27,550
Add O/S	9,000	20,000		
To Post & Stationary		750		
To Carriage out		1,000		
To Bad debts				
Add: New Provision	950			
Less: Old provision	1,265			
	2,,215			
To General Charges	350			
To Interest On Capital		1,865		
To Net Profit transferred		1,500		
To Capital Account		3,500		
		98,935		
		1,27,550		1,27,550

Table 7.13 Balance Sheet as at 31st December, 1999

Liabilities		Rs.	Assets		Rs.
Capital	70,000.00		Plant &		75,000.00
Add: Interest on Capital	3,500.00		Machinery		50,000.00
	73,500.00		Freehold Premises	50,600.00	
Add: Net Profit	96,461.60	1,69,961.60	Sundry Debtors		5,000.00
Sundry Creditors		10,000.00	Less: Provision		30,000.00
Bills Payable	20,000.00	5,000.00	Bills Receivable		1,000.00
Reserve	2,473.40		Closing Stock		5,300.00
Add: 2x1/2 % Net P. O/S Salaries		22,473.40	Overstated Stock 90		800.00
		9,000.00	Cash In Bank		
		2,16,435.00	Cash in Hand		2,16,435.00

COST ACCOUNTING

7.3 Important Definitions

Cost: Cost is the amount of expenditure actual (incurred) or notional (attributable) relating to a specific thing or activity may be a product, job, service, process or any other activity. Cost is the cash or cash equivalent values sacrificed to obtain some goods or services. Cash equivalent means that non cash assets can be exchanged for the desired goods or services.

Costing: Costing Accounting and Costing have distinctly different meanings. Costing is the process of determining the cost of doing something, e.g. the cost of manufacturing an article, rendering a service, or performing a function. The article manufactured, service rendered, or function performed is known as the object of costing. Objects of costing are always activities. Costing includes the techniques and processes of ascertaining costs.

Cost Accounting: Cost accounting, as a tool of management, is an integral part of the management process. Cost accounting records relevant data from production and other activities on a regular basis and reports these data to management for managing the undertaking. Cost accounting is the processing and evaluation of monetary and non-monetary data to provide information for internal planning, control of business operations, managerial decisions and special analysis, external reporting.

Objectives of Cost Accounting

Cost accounting aims primarily to serve the information needs of management for planning, control and decision-making. Cost accounting has the following three important objectives:

1. To determine product costs.
2. To facilitate planning and control of regular business activities.
3. To supply information for short-and long-run decisions.

1. Product Costing

The objectives of determining the cost of product is of prime importance in cost accounting. The total product cost and cost per unit of product are important in making inventory valuation, deciding price of the product, and managerial decision-making. Product costing covers the entire cycle of accumulating manufacturing and other costs and subsequently assigning them to work-in-progress and finished goods.

2. Planning and Control

Another important objective of cost accounting is the creation of useful cost data and information for the purposes of planning and control by management. The cost formulation in a well designed cost accounting system is oriented to help in planning, control and decision-making. The different alternative plans are evaluated in terms of respective cost and associated benefits. The management control over business operations aims to establish balance between actual and budgeted performances. A properly designed cost accounting system includes the following steps in the control process:

1. Comparing actual business performances with budgets and estimates.
2. Analyzing and variance between budgets and actual by causes, and management responsibility so that corrective action may be taken.
3. Providing managers with data and reports about their individual performances and performances of subordinates.

Cost data and information, thus, is an integral and vital part of management control.

3. Information for Decision

An important purpose of the cost accounting system is to provide data and special analysis for short and long-run decisions of a non-recurring nature. These decisions generally involve high cost commitments, such as buildings and equipments to be used for several years. They also represent unique opportunities, such as the possibility of developing new products and new market. Appropriate cost information must be accumulated to facilitate a wide variety of short-and long-run decisions. The concept of appropriate cost data is relevant to these matters in that no single type of cost information can satisfy all decision problems facing management.

Cost Accounting Vs. Financial Accounting

Both financial and cost accounting generates information and involves the analysis and flow of useful data. However, they differ in the following respects.

1. Nature

Basically, financial accounting classifies, records, presents and interprets, in terms of money, transactions and events that are of a financial character, and provides management with the facts and figures necessary for the preparation of the periodic financial statements, the balance sheet and the income statement. In contrast to financial accounting, cost accounting classifies records, presents and interprets in a significant manner the material, labor and overhead costs involved in manufacturing and selling each product or each job or rendering a service.

2. Primary users of information

The users of financial accounting statements are mainly external to the business enterprises. External users include shareholders, creditors, financial analysts, government authorities, stock exchange, labor unions etc.

The information generated under the cost accounting system is used by members of management at different levels. Thus, different sets of information could be developed under cost accounting and supplied to different person responsible for activities in the organization.

3. Accounting Method

Financial accounting follows the double-entry system for recording, classifying and summarizing business transactions. This accounting process results in

aggregate balances of all accounts maintained in a firm's books. Cost accounting is not based on the double-entry system. The data under cost accounting may be gathered for small or large segments or activities of an organization and monetary as well as other measures can be used for different activities in the firm.

4. Unit of Measurement

All information under financial accounting is in terms of money. That is, transactions measured in terms of money have already occurred. In comparison, cost accounting applies any measurement unit that is useful in a particular situation. Besides the monetary units, that cost accounting may find it necessary to use such measures as labor hours, machine hours and product unit for the purpose of analysis and decision-making.

5. Time Span

Financial accounting data and statements are developed for a definite period, such as annually, half-yearly, quarterly. It requires that financial statements be developed and presented at regular time intervals. Company annual reports may be prepared semi-annually or quarterly but the important point is that they are prepared on a regular basis.

Cost accounting report and statements are prepared whenever needed. Reports may be prepared on a monthly weekly or even daily basis. Frequency of reports is determined by particular planning and controlling needs, objectives of cost control and cost determination.

Cost Centres

A cost centre may be defined as a location, person or item of equipment (or group of these) for which costs may be ascertained and used for the purposes of cost control. A cost centre is an organizational segment or areas of activity for which it is desirable to accumulate costs. It is the segment that is considered to accumulate costs, but not to generate revenues. The accounting departments are also most universally considered cost centers as well as other staff functions. The following are the types of cost centers usually found in a manufacturing company.

Impersonal Cost Centre

A cost centre which consists of a location of item or equipment (or a group of these).

Personal Cost Centre

A cost centre which consists of a person or group of persons

Operation Cost Centre

A cost centre which consists of the machine and/or persons carrying out similar operations.

Process Cost Centre

A cost centre which consists of a specific process or a continuous sequence of operations.

Cost Unit

Cost unit is a unit of quantity of product, service or time (or a combination of these), in relation to which cost may be ascertained or expressed.

The following are a few examples of cost units:

<u>Industry</u>	<u>Cost unit</u>
Building	house or square foot of area
Chemical	tone, pound or kilogram
Cement	tone
Automobile	number
Steel	tone
Transport	tonne-kilometre, passenger-kilometer
Cable	meter
Gas	Cubic foot or cubic meter
Nuts and bolts	Gross or some measure of standard weight
Power	Kilo-watt hour
Paper	rim
Timber	Cubic foot

Elements of Cost

The cost of a product consists of the following cost components or elements:

1. Direct Material: Direct materials refer to the cost of materials which become a major part of the finished product. They are the raw materials that become an

integral part of the finished product and are conveniently and economically traceable to specific units of output. Some examples of direct materials are: raw cotton in textiles, crude oil to make diesel, steel to make automobile bodies.

2. Direct labor: Direct labor is defined as the labour associated with workers who are engaged in the production process. It is the labour costs for specific work performed on products that is conveniently and economically traceable to end products. Direct labour is expended directly upon the materials comprising the finished product. Examples are the labour of machine operators and assemblers.
3. Direct expenses include any expenditure other than direct material and direct labour directly incurred on a specific cost unit (product or job). Such special necessary expenses can be identified with cost units and are charged directly to the product as part of the prime cost. Some examples of direct expenses are: (a) cost of special layout, designing or drawings; (b) hire of tools or equipment for a particular production or product; (c) maintenance costs of such equipments.

The above three items: materials, labour and direct expenses constitute prime cost. According to Official Terminology of Chartered Institute of Management Accountant (London), Prime cost is the total cost of direct material and direct labour. Thus, direct expenses is not included in prime cost as per CIMA defines direct cost of the expenditure which can be economically identified with a specific saleable cost unit.

4. Factory overhead: Factory overhead also called manufacturing expenses or factory burden may be defined as the cost of indirect materials, indirect labour and indirect expenses. The term “indirect materials” refers to materials that are needed for the completion of the product but whose consumption with regard to the product is either so small or so complex that it would not waste, hand tools, works stationery. The term “indirect labour” is the labour cost of production related activities that can not be associated with or conveniently and economically traced to end products. Some examples of indirect labour are; foreman, shop clerks, general helpers, cleaners, materials handlers, plant guards, employees engaged in maintenance work or other service work. The term “Indirect expenses” covers all indirect expenditure incurred by the manufacturing enterprise from the

time production has started to its completion and transfer to the finished goods store. Any expenses not classified as direct expenses are known as indirect expenses.

5. Selling and Distribution and Administrative Overhead: Selling and distribution overhead is also known as marketing or selling overhead. Distribution expenses usually begin when the factory costs end. Such expenses are generally incurred when the product is in saleable condition. It covers the cost of marking sales and delivering/dispatching products. These costs include advertising, salesmen salaries and commissions, packing, storage, transportation, and sales administrative costs. Administrative overhead includes costs of planning and controlling the general policies and operations of business enterprises. Usually, all costs which cannot be charges either to the production or sales division are considered as administrative costs of the general accounting department. Sometimes, some of such expenses as manger's salary are often allocated to manufacturing and included in factory overhead.

The sum of prime cost, factory overhead, distribution and administrative overhead is the cost to make and sell.

Fixed, Variable And Mixed Cost

Cost can be classified into (I) fixed cost (ii) variable cost and (iii) mixed costs, in terms of variability of cost in relation to charges in activity or volume.

Fixed Cost: Fixed cost is a cost which does not change in total for a given time period despite wide flections in output or volume of activity. This includes expenses which must be incurred irrespective of the changes in use of direct materials and in production. Examples of fixed costs are rent, property taxes, supervising salaries, depreciation on office facilities, advertising, insurance, etc. These fixed costs accrue or are incurred with the passage of time and not with the production of the product or the job. This is the reason why fixed costs are expressed in terms of time, such as per day, per month or per year and not in terms of unit. It is totally illogical to say that a supervisor's salary is so much per unit. But it can be said that a supervisor is salary is so much per month. Fixed

cost per unit varies due to change in output. If production declines, fixed cost per unit increases. In case of higher output fixed cost per unit decreases.

Fixed costs can be further classified in the following categories for the purpose of analysis

1. **Committed Costs:** Such costs are primarily incurred to maintain the company's facilities and physical existence, and over which management has little or no discrimination, taxes, insurance premium rate and rent charges are examples of committed costs.
2. **Managed costs:** Managed costs are related to current operations which must continue to be paid to ensure the continued operating existence of the company, e.g., management and staff salaries.
3. **Discretionary costs:** They are also known as programmed costs. Discretionary costs are not related to current operations or activities and are subject to management discretion and control. These costs result from special policy decisions. management programmers, new researches, etc. Such costs can be avoided at management's discretion in a relatively short period of time as compared to committed costs. Some examples of such costs are research and development costs, marketing programmes, new system development costs.

Variable Cost: Variable costs are those costs that vary directly and proportionately with the output. There is a constant ratio between the change in the cost and change in the level of output. Direct materials cost and direct labour cost the costs which are generally variable costs. For example, if direct material cost is Rs. 5 per unit, then for producing each additional unit, direct material cost increases in direct proportion to increase in units manufactured. However, it should be noted that it is only the total variable costs that change as more units are produced; the per unit variable cost remains constant. Variable costs result from the utilization of raw materials and direct labour in the production departments. Variable manufacturing overhead like factory supplies, indirect materials, sales commission, office supplies are some other examples of variable costs. Variable costs accumulate because units of product are being manufactured, not because a period of time has passed.

Mixed Costs: Mixed costs are made up of fixed and variable elements. They are a combination of semi-variable costs and semi-fixed costs. Because of the variable component, they fluctuate with volume; because of the fixed component, they do not change in direct proportion to output. Semi-fixed costs are those costs which remain constant up to a certain level of output after which they become variable. Semi-variable cost is the cost which is basically variable but whose slope may change abruptly when a certain output level is reached. An example of a mixed cost is the earnings of a worker who is paid a salary of Rs.1, 000 per week (fixed) plus a bonus of 50 paise for each unit completed (variable). If he increases his weekly output from 1,000 units to 1,500 units, his earnings increase from Rs. 1,000 to Rs. 1,250. An increase of 50% in output brings only a 25 % increase in his earnings. Mathematically, mixed cost can be expressed as follows: $\text{Total Mixed Cost} = (\text{Units} \times \text{Variable Cost per Unit}) + \text{Fixed Cost}$

Direct Cost and Indirect Cost: A direct cost is one that can be economically traced to a single cost object. In manufacturing, the cost object is a unit of finished product. An indirect cost is one that is not directly traceable to the manufactured product, is associated with the manufacture of two or more units of finished product, or is an immaterial cost that cannot be economically traced to single unit of finished product. A comparison of the labour cost of an assembly man and a repairman in a cabinet shop will illustrate the difference between direct and indirect costs. The assembly man's salary is typically classified as a direct cost because it is a significant portion of the cabinet's total cost and because it is easy to trace the assemblyman's efforts to a particular set of cabinets. The machine repairman's salary would probably be classified as an indirect cost. It is difficult, or impossible, to trace the repairman's effort to a unit of output. The repairman is responsible for keeping all machines running properly. Since the repairman works on several machines and the machines work on several different cabinets each day, we cannot trace his salary to a particular cabinet. Also, the repairman's salary is generally immaterial in relation to the total cost of the product. However, even if it were material, the lack of traceability would require that it be classified as an indirect cost.

Example: A company manufactures and retails clothing. You are required to group the costs which are listed below and numbered 1 to 20 in to the following classification: (Each cost is intended to belong to only one classification).

- (a) Direct Materials
- (b) Direct Labour
- (c) Direct Expenses
- (d) Indirect Production Overhead
- (e) Selling and Distribution Costs
- (f) Research and Development Costs
- (g) Finance Cost
- (h) Administration Costs

1. Telephone rental plus metered calls.
2. Wages of security guards for factory.
3. Parcels sent to customers.
4. Wages of operators in cutting department
5. Developing a new product in the laboratory
6. Wage of fork lift truck drovers who handle raw materials
7. Wages of storekeepers in materials store
8. Chief accountant's salary
9. Cost of painting advertising slogans in delivery vans.
10. Auditor's fee
11. Cost of advertising on television
12. Lubricants for sewing machines.
13. Floppy disks for general office computer.
14. Maintenance contract for office photo-copying machine.
15. Interest on bank overdraft
16. Market research undertaken prior to new product launch.
17. Carriage on purchase of raw material
18. Royalty paid on number of units of a particular product produced.
19. Road licenses for delivery vehicles.
20. Amount payable to a company for broadcasting music throughout the factory.

Solutions:

Cash Element	Numbers
Direct Materials	17
Direct Labour	4
Direct Expenses	18

Financial Cost	15
Research and Development Expenses	5
Selling and Distribution Cost	16,19,3,11,9
Administration Cost,	13,14,1,10,8
Indirect production Costs	12, 20,2,7,6

Material Cost accounting and control

The term “materials” generally used in manufacturing concerns, refers to raw materials used for production, sub-assemblies and fabricated parts. The terms “materials” and “stores” are sometimes used interchangeably. However, both the terms differ. “Stores” is wider in meaning and comprises many other items besides raw materials, such as tools, equipments, maintenance and repair items, factory supplies, components, jigs, fixtures. Sometimes, finished goods and partly finished goods are also included within the scope of this term.

Purchasing and Receiving Procedure

Purchasing procedures vary with different business firms, but all of them follow a general pattern in the purchases and receipt of materials and payment of obligations. The important steps may be listed as follows:

1. Purchase requisition: A form known as a purchase requisition is commonly used as a formal request to the purchasing department to order goods or services. Usually, purchase requisitions are prepared by the storekeepers for regular store items which are below or approaching the minimum level of stock or to replace stock of materials and part in stores.

The production control department can also give requisitions for the purchase of specialized materials. A typical purchase requisition contains details, such as number, date, and department. Quantity, description, specification, signature of the person initiating the requisition, and signature of one or more officers approving the

purchase. Copies of the purchase requisition are sent to the purchasing department and accounting department.

ABC COMPANY LIMITED

Purchase requisition

Purchase Requisition No _____

Purchase Order No. _____

Date _____

Department _____

Delivery Required _____

Item No.	Quality	Particulars of articles	Grade or quality	Remarks

Required By

Checked By

Approved By

2. Purchase order: After the requisition is received duly approved, the purchasing department places an order with a supplier, offering to buy certain materials at stated prices and terms. For routine purchases, the order is placed through established suppliers. In other cases, the purchasing department may ask for bids or send out requests for quotation before placing the order.
3. Receiving materials: The receiving department performs the function of unloading and unpacking materials which are received by an organization. This will need an inspection report which is sometimes incorporated in the receiving report, indicating the items accepted and rejected, with reason. Two functions are performed by the receiving report:

- (i) It determines and places initial responsibility for materials on the receiving clerk; the receiving clerk continues to have this responsibility until delivery is made to the storeroom. In some business firms the store department functions as the receiving department also.
 - (ii) It notifies the accounting department that the materials have been received and that
 - a voucher can be prepared for payment.
4. Approval of invoices: Invoice approval indicates that goods according to the purchase order have been received and payment can now be made. However, if the goods or equipment received are not of the type ordered, or are not in accordance with specifications, or are damaged, the purchasing department issues a return order indicating that the goods are to be returned to the supplier. When the invoices of goods are received by the purchasing department, the process of gathering the relevant documents connected with each purchase and the preparation of the voucher begin.
 5. Making Payment: After the purchase invoice total is approved, the process of making payment begins. Payment depends on the terms agreed upon on any particular order, and any terms which differ from normal practice should be considered individually. When it is found that items written on the invoice qualify for payment, a remittance advice is prepared after providing of deduction of discounts, if any.

Issues In Materials Procurement

It is generally accepted that quantities be bought in economic size so that there may not be overstocking. If a company purchases in large quantities, the cost of carrying the inventory would be high because of the high investment involved. Working capital which could have been used for other productive purposes has to be diverted. Over-stocking requires more storage space which in turn, means increases in insurance expenses, storage cost and deterioration in quality and depreciation in quantity. In contrast, if purchases are made in small quantities (under-stocking), frequent orders would have to be placed for the purchase of materials. There will be danger of “stock outs” also. Because of under-stocking, production is likely to suffer; materials have to be purchased

immediately at high process; low output would increase cost and decrease profit; the other department's work may be adversely affected.

Economic Order Quantity (EOQ) (Reorder Quantity)

The EOQ is the optimum or the most favorable quantity which should be purchased each time the purchases are to be made. The EOQ is one where the costs of carrying inventory are equal or almost equal to the cost of not carrying inventory (Cost of placing order). Also at EOQ level, the total of these two costs is minimum.

The cost of carrying the inventory is the real out-of-pocket cost associated with having inventory on hand, such as warehouse charges, insurance, heat, light, and losses due to spoilage, breakage, pilferage. Another opportunity cost, which is not out-of-pocket cost, is important and should be considered, i.e., cost incurred (capital used) in purchasing the inventory. If funds have been borrowed to finance the inventory purchase, interest payments on borrowed funds will be the direct cost. Carrying or holding costs of inventory are explicit as well as implicit, that is, some costs are readily ascertained from accounting records while others require extensive study to estimate them because they are not expressly stated. Insurance on inventory is an explicit cost while the cost of funds invested in inventory is implicit cost. Generally, inventory carrying costs are considered to be proportional to the value of inventory carried.

The costs of not carrying adequate inventory arise because of frequent placing of order at short intervals. This includes costs, such as extra purchasing, handling and transportation costs, higher price due to small order quantities, frequent stock-outs resulting in disruption of production schedules, overtime and extra set up time, loss of sales and customer goodwill, etc.

The costs of carrying the inventory and ordering costs change in the reverse order. The costs of placing the order decrease as the size of the order increase since with a bigger size of order, the number of the order will be lower. However, simultaneously the costs of carrying the inventory will go up because purchases have been made in large quantities. It may be possible to have a point which provides the lowest total cost and this point (ideal size) is known as the EOQ. This equilibrium can be determined mathematically as follows:

$$EOQ = \sqrt{(2U * O) / (I * C)}$$

Where U = Annual usage in units

O = Cost of placing an order

I = Percent cost of carrying inventory

C = Cost per unit of material

Assume

Annual usage units	=	6,000
Cost of placing an order	=	Rs. 30
Carrying cost as a percent of inventory	=	20%
Cost per unit of material	=	Rs.5

Then, $EOQ = \sqrt{(2 * 6000 * 30) / (5 * 20\%)} = \sqrt{3,60,000} = 600$ units

In the above example, the EOQ is 600 units. That is, ten orders per year are needed. At the level of 600 units, the ordering costs and the carrying costs are equal and also the total cost is at minimum as it is clear from Table 14.1

Table 7.14 shows that quantities of other orders resulting in more or less than ten orders per year are not economical as they involve higher total costs.

The EOQ formula is sometimes expressed in the following manner which is not in any way different from the formula explained earlier

$$EOQ = \sqrt{(2U * P) / S}$$

Where U = Annual demand or consumption or purchased quantity (in units)

P = Cost of placing an order

S = Annual cost of carrying inventory per unit (Storage and interest)

Table 7.14 Quantities of other orders

Annual Usage	Orders Per Year	Units Per Order	Average Inventory (units)	Value Per Order (Rs.)	Average Inventory Amount (Rs.)	Order Cost	Carrying Cost (20%)	Total Cost (Rs.)
6,000 units	1	6,000	3,000	30,000	15,000	30	3,000	2,030
	2	3,000	1,500	15,000	7,500	30	1,500	1,500

3	2,000	1,000	10,000	5,000	90	1,000	1,090
4	1,500	750	7,500	3,750	120	750	870
5	1,200	600	6,000	3,000	150	600	750
6	1,000	500	5,000	2,500	180	500	680
7	857	429	4,285	2,142	210	428	638
8	750	375	3,750	1,875	240	376	616
9	667	334	3,335	1,668	270	334	604
10	600	300	3,000	1,500	300	300	600
11	545	273	2,725	1,363	330	272	602
12	500	250	2,500	1,250	360	250	610

When to order (Reorder Level)

The EOQ determines how much to buy at a particular time. But the question “When to buy” is equally important for business firms. This question is easy to answer only if we know the lead time – the time interval between placing an order and receiving delivery – and know the EOQ, and are certain of the consumption pattern during lead time. The order point or re-order level is a point or quantity level at which if materials in stores reach, the order for supply of materials must be placed. This point automatically initiates a new order. The order point is calculated from three factors:

1. The expected usage
2. The time interval between initiating an order and its receipt, referred to as the lead time
3. The minimum inventory, or safety stock

For example, if daily usage is 400 units of material which have a lead time of 20 days and the safety (minimum) stock is 500 units, the order point will be calculated as follows:

$$\begin{array}{rcl}
 \text{Daily consumption * lead time} & = & 400 * 20 = 8,000 \\
 \text{Add safety stock} & = & 500
 \end{array}$$

$$\text{Order point units} = 8,500$$

The order point is determined after considering the worst possible expected conditions. This only ensures that the minimum stock will always remain in the inventory and will not be used at least in the short run. However, situations may arise where there will be stock – out and thus, the order point may not be an absolutely accurate forecasting.

Determinations of Safety or Minimum Stock Levels

It is advisable to carry a reserve or safety stock to prevent stock-out. The safety should be used only in abnormal circumstances, and the working stock in ideal or normal conditions. Therefore, for normal working conditions, the stock should not be allowed to fall below the safety limit, kept only for emergencies. If the usage pattern is known with certainty, and the lead time is also known accurately, then no safety stock would be needed. However, if either usage or lead time is subject to verification then it is necessary for a business firm to maintain safety stock levels equal to the difference between the expected usage over lead time and the maximum usage over lead time that the firm feels is necessary for cost minimization. The safety stock level can be computed by using the following formula:

$$\text{Safety stock level} = \text{Ordering level} - (\text{Average rate of consumption} * \text{Re-order period})$$

Or

$$\text{Safety stock level} = (\text{Maximum rate or consumption} - \text{Average rate of consumption}) * \text{Lead time}$$

$$\begin{aligned} \text{That is,} &= (425 - 400) * 20 \text{ days} \\ &= 500 \text{ units} \end{aligned}$$

Maximum Stock Level

The maximum level ensures that the stocks will not exceed this limit although there may be low demand for materials or quick delivery from the suppliers. Maximum stock level can be computed as follows:

$$\text{Maximum stock level} = \text{EQQ} + \text{Minimum stock}$$

Or

Maximum stock level = Re-order level + EOQ – (Minimum Consumption * Minimum re-order period)

Danger Level

Generally the danger level of stock is indicated below the safety or minimum stock level. Sometimes, depending on the practices of the firm and circumstances prevailing, the danger level is determined between re-order level and minimum level. In the second case (danger level being between re-order level and minimum level), the firm can only take steps to ensure that materials ordered will arrive in time.

Average stock Level

Average stock level is computed in the following manner:

$$= \frac{\text{Minimum stock} + \text{Maximum stock}}{2}$$

Or

$$= \frac{\text{Minimum level} + \text{Re-order quantity}}{2}$$

The following example further illustrates the different stock levels.

Maximum usage (units)	650 per days
Minimum usage (units)	300 per days
Normal usage (units)	500 per days
Economic order quantity (units)	75000
Re-order period –lead time	25 to 30 days
Minimum level (units)	5000
(10 days at normal usage)	

The different stock levels will be as follows:

Re-order level = Normal usage x Normal lead time + Minimum level

$$= (500 * 30) + 5,000$$

$$= 20000 \text{ units}$$

$$\text{Maximum level} = \text{Reorder level} + \text{EOQ} - \text{Minimum quantity used in re-order period}$$

$$= 20,000 + 75,000 - (300 * 25)$$

$$= 87,000 \text{ units}$$

$$\text{Average Level} = \frac{\text{Maximum} + \text{Minimum}}{2}$$

$$= \frac{87,500 + 5,000}{2}$$

$$= 46,250 \text{ units}$$

After placing an order, if usage goes above average or if the lead time is longer than expected, then the stock will fall below minimum. However, stock will not be exhausted, so long as the maximum usage and maximum re-order periods are not exceeded. In the above example, maximum usage during the lead time would cause an extra 4500 units (30 days X 150 units) to be consumed. Therefore, in this situation, the purchasing officer should try to chase supplies to ensure that delivery promises are kept.

Example

The Ganges pump Company uses about 75,000 valves per year and the usage is fairly constant at 6,250 per month. The valves cost Rs.1.50 per unit when bought in quantities and the carrying cost is estimated to be 20 % of average inventory investment on the annual basis. The cost to place an order and process the delivery is Rs.18.

It takes 45 days to receive from the date of an order and a safety stock of 3,250 valves is required. You are required to determine:

- (i) The most economic order quantity and frequency of orders
- (ii) The order point
- (iii) The most economic order quantity if the valves cost Ts 4.50 each instead of Rs.1.50 each

Solution

$$\begin{aligned}
 \text{(i) EOQ} &= \sqrt{(2U*O)/(I*C)} \\
 &= \sqrt{(2*75000*18)/(1.5*20\%)} \\
 &= \sqrt{90,00,000} \\
 &= 3,000 \text{ units or 25 orders per year}
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii) The order point} &= \text{Safety Stock} + (\text{Average rate of consumption} \times \text{Lead time}) \\
 &= 3,250 + (6,250 \text{ units' p.m} * 1.5 \text{ months}) \\
 &= 3,250 + 9,375 \\
 &= 12,625 \text{ units}
 \end{aligned}$$

(iii) EOQ when cost per valve is Rs.4.50

$$\begin{aligned}
 \text{EOQ} &= \sqrt{(2*75000*18)/(4.5*20\%)} \\
 &= \sqrt{30,00,000} \\
 &= 1,733 \text{ unit's approx. or 43 order approx. per year}
 \end{aligned}$$

Example

Material X and Y are used as follows:

Minimum usage – 50 units each per week.

Maximum usage – 150 units each per week

Normal usage –100 units each per week

Ordering quantities X = 600 units
 Y= 1000 units

Deliver period X= 4 to 6 weeks
 Y = 2 to 4 weeks

Calculate for each material: (a) Minimum level: (b) Maximum level: and (c) Order level

Solution***Material X***

$$\begin{aligned}\text{Ordering level} &= \text{Maximum usage} * \text{Maximum delivery period} \\ &= 150 * 6 \\ &= 900 \text{ units}\end{aligned}$$

$$\begin{aligned}\text{Minimum level} &= \text{Ordering level} - (\text{Normal usage} * \text{Normal delivery period}) \\ &= 900 - (100 * 5) \\ &= 900 - 500 \\ &= 400 \text{ units}\end{aligned}$$

$$\begin{aligned}\text{Maximum level} &= (\text{Ordering level} + \text{Ordering quantity}) - \\ &\quad (\text{Minimum usage} * \text{Maximum delivery period}) \\ &= 900 + 600 - (50 * 4) \\ &= 1,500 - 200 \\ &= 1,300 \text{ units}\end{aligned}$$

Material Y

$$\begin{aligned}\text{Ordering level} &= \text{Maximum usage} * \text{Maximum delivery period} \\ &= 150 * 4 \\ &= 600 \text{ units}\end{aligned}$$

$$\begin{aligned}\text{Minimum level} &= \text{Ordering level} - (\text{Normal usage} * \text{Normal delivery period}) \\ &= 600 - (100 * 3) \\ &= 600 - 300 = 300 \text{ units}\end{aligned}$$

$$\begin{aligned}\text{Maximum level} &= (\text{Ordering level} + \text{Ordering quantity}) - \\ &\quad (\text{Minimum usage} * \text{Maximum delivery period}) \\ &= 600 + 1,000 - (50 * 2) \\ &= 1,600 - 100 = 1,500 \text{ units}\end{aligned}$$

Notes: Normal period of delivery has been computed as follows:

$$\text{Material X} = \frac{4+6}{2} = 5 \text{ weeks}$$

$$\text{Material Y} = \frac{(2+4)}{2} = 3 \text{ weeks}$$

7.4 INVENTORY SYSTEMS

There are two principal ways of accounting for inventories:

Perpetual Inventory System

The perpetual inventory method requires a continuous record of additions to or reductions in materials, work-in-progress, and cost of good sold on a day-to-day basis. Physical inventory counts are usually taken at least once a year in order to check on the validity of the accounting records. The Institute of Cost and Management Accountant (U.K.) has defined perpetual inventory as:

A system of records maintained by the controlling department which reflects the physical movement of stocks and their current balance.... A perpetual inventory is usually checked by a programme of continuous stocktaking, and the two terms are sometimes loosely considered synonymous. Perpetual inventory means the system of records, whereas continuous stocktaking means the physical checking of those records with actual stocks."

The perpetual inventory method has the following advantages:

- The stock-taking task which is long and costly is avoided under this method.
- The inventory of different items of materials in accordance with the stores ledger can be promptly prepared for the preparation of the income statement and balance sheet at interim periods if required without a physical inventory being taken.
- Management may be informed daily of the number of units and the value of each kind of material on hand-information which tends to eliminate delays and stoppage in production.
- The investment in materials and supplies may be kept 'at the lowest point in confined with operating requirements.
- A system of internal check is always in operation and the activities of different

departments, such as purchasing, stores and production are continuously checked against each other.

- It is not necessary to stop production so as to carry out a complete physical stock-taking.
- Discrepancies and errors are promptly discovered and localized and remedial action can be taken to avoid their occurrence in the future.
- This method has a moral effect on the staff, makes them disciplined and careful and acts as a check against dishonest actions.
- The disadvantages of excessive stock are avoided, such as loss of interest on capital invested in stock, loss through deterioration, risk of obsolescence.

Periodic Inventory System

Under the periodic method, the entire book inventory is verified at a given date by an actual count of materials on hand. This physical inventory is usually taken near the end of the accounting period. This method provides for the recording of purchases, purchase returns and purchase allowances on a daily basis but does not provide for a continuous inventory or for a daily computation of the cost of goods sold. At the end of each accounting period, a physical count is made of the quantity of goods on hand and the value of the inventory is determined by using an inventory pricing method (FIFO, LIFO or Average Cost) and attaching cost to units counted. The cost of good sold is computed by deducting closing inventory from the sum of opening inventory and purchases made during the current period. It is assumed that goods not on hand at the end of accounting period have been sold. There is no system and accounting for shrinkage, losses, theft and waste throughout the accounting period and they can be discovered only after the end of the period

Labour Cost Accounting and Control

Proper control and accounting for labour costs is one of the most important objectives of all business firms. Cost accounting for labour has three primary objectives:

- Determining labour costs in the cost of product or service.

- Reporting labour costs for planning and control.
- Reporting labour costs for decision-making.

For a manufacturing business firm engaged in producing a specific product, labour costs are accumulated and charged to the product as they are produced. Similarly, in a service (not-for-profit) organization, total cost as well as the cost of different functions (services) is to be determined. This helps the Organization to know what it costs them to provide a service or perform some activities. The second objective is to provide management with labour cost information for effective planning of the labour force in the organization and for, adequate control of labour costs. The control process of labour cost involves a comparison of actual labour costs with standard labour cost. The differences between the two are then analysed and possible reasons are determined so that management can take suitable action to control the labour cost expenditure in future periods.

Labour cost information is used for decision-making purposes also. Many managerial decisions, such pricing decision, expansion of business, dropping a product line, replacement of plant and equipment, entering into a new market, etc. require information about current actual labour costs and emerging trends there in

7.5 Wage Systems

An important aspect of labour cost control is a wage system designed primarily for exercising management control over labour. The following objectives should be considered in the selection of a wage system:

- Acceptance by employees to avert slowdowns and work stoppages.
- Provision for flexibility.
- Provision for economy in administration.
- Supplying of labour statistics for use in industrial relations and for trade associations, government agencies and competitors.
- Stabilisation of labour turnover.
- Minimising of absenteeism.
- Provision for incentive plans.

Basically there are two wage systems to pay for labour: (i) straight time which is by hour, day, or week, and (ii) piece work, which is by the unit of product.

Straight Time

Under the time basis, the worker is paid at an hourly, daily or weekly rate and his remuneration depends upon the time for which he is employed and not upon his production. If a worker works for overtime, the wage agreement usually provides that all hours worked in excess of an agreed number are paid for at a higher rate. The time basis wage system for direct labour is found in those industries where:

- The speed of production cannot be influenced by the energy or dexterity of the workmen
- The quality of work is of paramount importance.
- It is difficult to measure the work done by the employee.

Piece Work

Under this method, a fixed rate is paid for each unit produced, job performed or number of operations completed, and the worker's wages thus depend upon his output and not upon the time he spends in the factory.

Incentive Wage Plans

The basic purpose of an incentive wage is to induce a worker to produce more so that he can earn a higher wage and, at the same time, unit costs can be reduced. Incentive wage plans aim to ensure greater output, to help control over labour costs by minimisation of total cost for a volume of production and to have a basis for reward from hours served to work accomplished.

Incentive wage scheme has the following objectives:

1. Un-interrupted and higher production without any dispute between the labour and management.
2. Stability in labour turnover.
3. Reducing labour absenteeism.
4. Developing cooperation, mutual trust, attitude of team work among workers and between workers and supervisory staff.
5. Control of labour cost and reduction in labour cost per

unit of output.

6. Improving administrative efficiency.
7. Accurate budgeting through reliable labour cost information.
8. Generating workers' satisfaction by avoiding work stoppage, slow down, and by providing incentive scheme.

The following are the essentials (desirable characteristics) of a successful incentive wage plan:

1. A wage incentive system should be based upon standards of performance - time and motion
 - a. Studies, job evaluation, and merit rating.
2. The incentive plan should be understood by all employees before installation (or hiring).
3. All direct labour tasks should be on an incentive basis.
4. Only standard or acceptable quality production should be considered while determining the bonus.
5. Once the standard is set, it should not be changed unless the method changes.
6. The incentive. Programme must be fairly and intelligently administered.
7. It is highly desirable that indirect personnel share in the incentive plan.
8. A high reward should be paid for performance above standard.
9. Individual incentives should be used wherever it is possible to do so.
10. Minimum wage should be guaranteed to every worker.
11. The views of both employers and employees should be considered while designing incentive schemes.
12. The cost of establishing and operating the incentive plans should be reasonable.
13. The incentive plans should help in standard cost and budgetary control programmes.

Incentive wage plans involve wage rates based upon various combinations of output and time and are known as "different piece-rates" and "bonus-plans" as well. Generally, the following types of incentive plans are used:

- Taylor Differential Piece-rate System
- Merrick Differential Piece-rate System

- Gantt Task Bonus Plan
- Premium Bonus Plans (Halsey. Halsey-Weir. Rowan. Bedaux, Emersion, etc.)

Taylor Differential Piece-rate System

Under this system there are low wage rates, a low one for output below standard and a higher one for above standard predominance. The system aims to discourage below average workers by providing no guaranteed hourly wage and by setting low piece rates for low level production, and a high rate resulting in high earnings if an efficient level of production is attained. For example, in a factory, workers earn Rs. 24 per eight hour day and that production averages 12 units per hour per worker or 25 paise per unit. The Taylor system might suggest a pay of 20 paise per unit if the worker averaged 14 units or less per hour, but 30 paise per unit to workers averaging 15 units or more per hour. The main advantages of the Taylor system are that it provides a strong incentive to the efficient worker, and is simple to understand and operate. But the incentive level may, be set so high that it cannot attract most workers.

Merrick Differential Piece-rate System

This is an improvement over the Taylor system and depends on using three rates instead of two as in the Taylor system. Normal' piece-rates are paid on output, when it does not exceed 83% of the standard output. 110% of normal price rate are paid when the output is between 83% and 100%, and 120% of the normal piece-rate is' paid if the output is above 100%.

The Merrick system is useful to highly efficient workers as it provides incentives for higher production. Similarly, it takes into account the less efficient worker who can at least achieve 83% of the standard output. This minimum output. Is probably achievable by all workers?

Calitt Task and Bonus Plan

This system combines a guaranteed lime-rate with a bonus and piece rate plan using the differential piece-rate principle. Remuneration under the 'plan is computed as follows:

<i>Output</i>	<i>Payment</i>
1. Output below standard (high task)	Time-rate (guaranteed)
2. Output is standard	Bonus @ 20% on the time-rate
3. Output above standard	High piece-rate on worker's whole output

This plan provides incentives and opportunities to those who reach high level production. At the same time it provides security and encouragement to less skilled workers. It is simple to understand and workers are also satisfied in that they receive the total reward for their efforts. A limitation of the plan is the tendency on the part of trade unions to demand a high fixed guaranteed time-rate. Buuhe incentive element of the plan would be lost in case too high a rate is fixed.

Premium Bonus Plans

Under the time-rates basis, any additional production above normal levels benefits the employer, whereas with the piece-rates system the benefit goes to the employees (apart from indirect benefits to the employer). Bonus plans have been developed to produce a compromise, in that any savings are shared between employer and employee. The following are the principal schemes under premium bonus plans.

Halsey Premium Plan

The principle of the Halsey scheme is that the worker receives a fixed proportion of any time which he can save by completing the job in less than the allowed time. The most common fixed proportion is 50% but this can be varied. This plan ensures that the employee receives time wages until he produces in less than standard time. For above standard production, savings are shared with the employer with the result that the rates of increase happen to be lower for the employee. The cost per unit decreases when production exceeds standard.

Halsey- Weir Plan

This plan is also know as the Weir Premium Scheme and is based on a $33\frac{1}{3}:66\frac{2}{3}$ sharing plan. Under this scheme the total enrolments of a worker are the aggregate of

guaranteed hourly wages for actual time worked, plus the amount of bonus at the rates of $33\frac{1}{3}\%$ of the time saved. Bonus is allowed at the same hourly rate at which he shall be paid for actual time worked.

Rowan Plan

This scheme is similar to the Halsey Plan in that a standard time is fixed for the completion of a job and the bonus is paid in respect of the time saved. But a ceiling is applied to the size of the bonus. The bonus hours are calculated as a proportion of the time taken which the time saved bears to the time allowed, and is paid for at time-work rates. The bonus may be computed as follows:

$$\text{Bonus} = \frac{\text{Time taken} - \text{Time allowed}}{\text{Time allowed}} \times \text{Time saved} \times \text{Time rate}$$

Bedaux Point Plan

Under the Bedaux point plan a guaranteed hourly rate is paid until standard production is attained, and a premium or additional wage is paid for units in excess of standard. Instead of being paid as piece rate, an hour's work is converted to points by dividing a standard hour's production in units into 60 minutes. In other words, if 10 units are standard, then each unit is 6 points and if 15 units are standard then each unit is 4 points. At standard performance the worker produces a point per minute and for the first 60 points produced in an hour, the worker receives the hourly rate. For excess production, it is common practice to pay the worker 75% of the rate, and the foremen, supervisors and the other indirect labour personnel receive 25% of the rate.

Emerson Efficiency Plan

Under the Emerson plan a minimum daily wage is guaranteed and a standard time is determined for each job or operation. During each payroll period a record is kept of the hours worked and the units produced, and the efficiency of each employee is then

determined by dividing actual hours into the standard' time for the units produced. For example, if the standard is 10 units per hour and a worker produces 320 units in an 80-hour week, the standard time for his output is 32 hours and he has worked at 80% efficiency. Below 67% efficiency, the worker is paid his hourly rate, and from 67% upto 100% efficiency, step bonus rates apply. Above 100% efficiency, an additional bonus of 1 % of the hourly rate is paid for each 1% increase in efficiency.

Labour Turnover

Labour turnover is the rate at which employees leave employment _ at a factory and is normally measured as the ratio of the number of persons leaving in period to the average number on the payroll. For example, if 100 persons leave a company in a year and the average number on the payroll is 500, labour turnover is expressed as 20% p.a. In this calculation all persons who leave must be included, whether they leave voluntarily or are dismissed and irrespective of whether they are replaced. There are three methods of measurement of labour turnover.

(All employees leaving/ Average number employed) * 100

(Number of replacement in a period/ Average number employed) * 100

(All employees leaving plus new employees/ Average number employed) * 100

Among the three methods, the first method is to be preferred, as it is more appropriately a long-term indicator. This formula is more satisfactory as management is primarily concerned with the loss of labour, after money has been spent on training. The effects of a high or low turnover rate should then be analysed *e.g.*, on training costs, on production efficiency and employees morale

Overhead Costs: Allocation and Absorption

The total or full cost of a product consists of direct costs and indirect costs. The direct costs are easily traced or identified with the product or job without any difficulty. In a manufacturing organization, direct materials, direct labour and direct expenses are examples of direct costs.

Indirect costs or overhead* costs are not directly traceable to a product or job because they are incurred for two or more products; their clear identification with one product is not possible. There is no direct and observable way of determining how much of overhead costs belongs to each product. Due to these features, overhead costs are termed *indirect costs*. Indirect materials, indirect labour and indirect expenses are examples of indirect or overhead costs. There is a need to develop methods to decide the share of overhead costs for different products. The procedure of distributing or sharing out overhead costs to different is known as absorption of overheads.

The stages or steps involved in the absorption of overhead costs are:

Stage I: Collection or Gathering of Overhead Cost Information'

Stage II: Allocation and Apportionment of Overheads to Production and Service Departments.

Stage III: Apportionment of Service Department Overheads to Production Departments

Stage IV: Calculation of Appropriate Overhead Rates.

The overhead rates obtained finally after completing the above stages are used to charge overhead to products and jobs.

STAGE I: COLLECTION OR GATHERING OF OVERHEAD COSTS INFORMATION

The first step in accounting and distribution of overhead costs is their collection under proper headings Overhead costs items should be gathered and subsequently grouped together. The groupings of overhead

Costs are done through a technique known as codification. Codification *is a method of identifying and describing various overhead expenses in numbers or letters or in a combination of both*, so that cost data can easily be collected. Codification of the entire items is done through a 'proper coding system. Costs are done through a technique known as codification. Codification is a method of identifying and describing various overhead expenses in numbers or letters or in a combination of both %, so that cost data can easily be collected. Codification of the entire items is done through a 'proper coding system.

Methods of Codification

Some important methods of codification are mentioned below:

Serial Numbering System

Number Blocks

Combination of Alphabets and numbers

Numerical Codes

Mnemonic Method

Sources of Overhead Collection

Different sources are available in an organization to collect overhead expenses such as:

- Stores requisitions for items like indirect materials.
- Financial accounts - A large number of items may be taken from the financial accounts of the business enterprise.
- Wage book - Most indirect wages and labour-related costs.
- Cash book - for indirect expenses.
- Registers and reports - Plant and machinery register for depreciation, scrap, waste and spoilage can be discovered through investigation.

STAGE II: ALLOCATION AND APPORTIONMENT OF OVERHEAD COST TO PRODUCTION AND SERVICE DEPARTMENTS

The second stage in the charging of overhead costs is to identify overhead costs for different production and service departments. This stage is known as *primary distribution* also.

Some overhead costs can be directly identified with a particular department or cost centre as having been included for that cost centre. These items of overhead cannot be traced to products or jobs but can be allocated specifically to departments. Examples of such overhead costs are repairs and maintenance expenses incurred in specific departments, supervision, indirect labour, overtime, indirect materials and factory supplies including equipment depreciation.

Expenses such as power, light, rent, depreciation of factory building, expenses shared by all departments, cannot be charged directly to a department, be it producing or service. They are incurred for all and must, therefore, be apportioned to any or all

departments using such items. The apportionment should be done on some rational and equitable bases. It would be difficult to give a comprehensive list of the bases of apportionment. However, the following bases are in common use:

- Floor area occupied - Overheads such as lighting and heating, rent and rates, depreciation on building, building repairs, caretaking, watching and patrolling.
- Capital values - Depreciation on plant and machinery, insurance on building and plant and machinery, maintenance of plant and machinery.
- Direct labour hours and/or machine hours - Insurance on jigs, tools and fixtures, power, works management remuneration, repairs and maintenance cost.
- Number of workers employed - Canteen, accident insurance, medical, dental and first aid, pensions, personnel department expenses, profit sharing payments, recreation, supervision, time office, wages department.
- Technical estimate - Fire prevention, oil and grease, steam, water without meter.

Example

The Modem Co. is having four departments. A, B and C are the producing departments and D is a servicing department. The actual costs for a period are as follows:

	Rs.
Rent	2,000
Repair	1,200
Depreciation	900
Light	200
Supervision	3,000
Insurance	1,000
Employee's Insurance	300
Employer's liability Power	1,800

The following data are also available in respect of four departments

	Dept.A	Dept. B	Dept.C	Dept.D
Area Sq. ft	150	110	90	50
Number of workers	24	16	12	8
Total wages	Rs. 8,000	Rs.6,000	Rs. 4,000	Rs.2,000
Value of Plant	Rs. 24,000	Rs. 18,000	Rs.12,000	Rs.6,000
Value of Stock	Rs. 15,000	Rs. 9,000	Rs.6,000	-

Apportion the costs to the various departments on the most equitable method.

Table 7.15 Solution: Overhead Distribution Summary

Name of the Expense	Basis	Departments			
		A	B	C	D
Rent	Area	750	550	450	250
Repairs	Plant value	480	360	240	120
Depreciation	-do-	360	270	180	90
Supervision	No. of workers	1,200	800	600	400
Insurance	Value of stock	500	300	200	-
Employee's	Wages	120	90	60	30
Insurance	Area	75	55	45	25
Lighting	Plant value	720	540	360	180
Power					
	Total	4,205	2,965	2,135	1,095

Example

The modern company has four departments A, B, C is the production departments and D is the servicing department. The actual costs for a period are as follows:-

		Rs.
Production department	A	950
	B	1,200
	C	200
Servicing department		1,500
Indirect wages:		
Production department	A	900
	B	1,100
	C	300
Servicing department		1,000
Rent		2,000
Repair		1,200
Depreciation		900
Light		200

Supervision	3,000
Insurance	1,000
Employee's insurance (employer's liability)	300
Power	1,800

The following data are also available in respect of four departments

	Departments			
	A	B	C	D
Area	150	110	90	50
No. of workers	24	16	12	8
Total Wages	Rs.8000	Rs.6000	Rs.4000	Rs.2000
Value of plant	Rs.24000	Rs.18000	Rs.12000	Rs.6000
Value of stock	Rs.15000	Rs.9000	Rs.6000	-

Apportion the above costs to the various departments on the most equitable method:

Table 7.16 Solution:

Items	Basis	Total	Departments			
			A	B	C	D
Indirect wages	Allocation	3,850	950	1,200	200	1,500
Indirect wages	Allocation	3,300	950	1,100	300	1,000
	Area	2,000	750	550	450	250
	Plant value	1,200	480	360	240	120
Rent	Plant value	900	360	270	180	90
Repairs	Area	200	75	55	45	400
Depreciation	No. of workers	3,000	1,200	800	600	-
Light	Value of stock	1,000	500	300	200	30
Supervision	Wages	300	120	90	60	25
Insurance Employees	Plant value	1,800	720	540	360	180

Insurance						
Power						
		17,550	6,055	5,265	2,635	3,595

STAGE III: APPORTIONMENT OF SERVICE DEPARTMENTS' OVERHEAD TO PRODUCING DEPARTMENTS

In Stage III. Overhead costs of service departments are apportioned to production departments. The logic for such apportionment is that service departments do not themselves manufacture anything and it is the production departments which produce. Such apportionment is termed as *Secondary Distribution*.

The general basis for apportioning service departments overheads to producing departments are the following:

1. Service rendered (benefits obtained): This is perhaps the most popular method of apportioning service department costs. The services rendered to different departments, *i.e.*, benefits obtained by them can be a suitable basis. If a producing department has received large benefits, it must be charged for a share of overhead costs incurred to provide that quantity of benefits.
2. Ability to pay: This method suggests that a large share of servicing. Departments' overhead costs should be assigned to those producing departments whose product contributes the most to the income of a business enterprise.

3. Surveyor analysis: This method is applied where a suitable base is difficult to find or it would be too costly to select a method which is considered suitable. For example, the postage cost could be apportioned on a survey of postage used during a year.

4. Efficiency or incentives: This method uses standards and budgets and apportions the overhead costs on the basis of a present budget or standard.

In selecting a suitable base for apportioning service departments' overheads, considerations should be given to practicability, simplicity, economy, theoretical soundness and assistance in accurate costing and cost control. If a service department overhead is allocated on the basis over which the production manager has no control, the prorated cost may result in an inappropriate charge to the producing department.

The following list gives a few service departments and bases commonly used to apportion the respective overhead costs:

<u>Service Department</u>	<u>Apportionment Base</u>
Personal	Number of employees, labour hours, labours cost
Purchasing	Number of orders cost of materials.
Receiving	Cost of materials, number of units, number of orders
Stores	Cost of materials, number of requisitions, filled, number of units handled
Factory office	Number of employees, labour hours, labour cost
Machine maintenance and Repair	Machine hours, labour hours, labour cost, service rendered
Engineering	Machine hours, labour hours, service rendered
Payroll	Total labour or machine hours or number of employees in each department
Welfare, Canteen, Recreation & Medical	Number of employees in each department
Building, service Department	Relative area of each department
Internal Transport Service	Weight, value, graded products, weight and distance

Inter-Departmental Service

While apportioning service departments' overheads, one may notice two situations: (i) first, the entire amount of a servicing department is to be distributed only to the producing department. This does not involve any practical difficulty and provides the simplest and quickest method for apportioning costs of the servicing department. (ii) Second, service provided by some servicing departments is used partly by other servicing departments. That is, many service departments serve each other. For example, the payroll department in a firm prepares payroll for the entire organisation, but it depends on the building maintenance department for repair and maintenance services. Similarly, the building maintenance department provides services for all departments using the building, but it gets service from departments like stores, factory office and personnel. This second situation is known as *inner-departmental services*.

There are mainly two methods to deal with apportioning overheads under inter-departmental service:

A Continuous apportionment: In this method the process of apportioning service departments' overheads is continued until the figures become immaterial or totally exhausted. The following stages are involved in this method:

- Use the given percentages to apportion the original total of the first service department. This closes the account of the first service department and transfers prorated amounts to other departments.
- Use the given percentages of the second service department whose total is made up of original amount plus prorated amount of service department first. This closes the account of the second service department and assigns prorated amounts to the other departments including service department also.
- Follow the same procedure with respect to all other service departments.
- Repeat a second cycle of apportionment starting with the service department first, whose total consists, at present, only of amounts prorated from other service departments. In this way, the service department totals become less and less with each cycle of apportionment because each time a substantial amount is apportioned to the producing departments.

- Stop the above cycle at any point where it is found that the remaining figures (to be apportioned) are too small to be of any consequence or when the figures are totally exhausted.

Example

The overhead of a manufacturing company has been analysed to the point of primary distribution.

	<i>Rs.</i>
Production departments: Machine	10,000
Assembly	4,000
Service departments: Canteen	2,000
Powerhouse	3,000

The canteen is to be apportioned on the basis of employees

	Employee's	%
Machine	240	60
Assembly	140	35
Powerhouse	20	5
	400	100

The powerhouse is to be apportioned on the basis of electricity used:

	Thousand kilowatt	%
Machine	270	75
Assembly	36	10
Canteen	54	15
	360	100

The apportionment would be done in the following manner

	Machine	Assembly	Canteen	Powerhouse
Primary apportionment	10,000	4,000	2,000	3,000
Apportion : Canteen	1,200	700	-2000	100
Power house	2,325	310	4,675	-3,100
Canteen	279	163	-465	23
Powerhouse	18	2	3	-23
Canteen	2	1	-3	
Total Service Dept	3,824	1,176		
Total Production over head	13,824	5,176		

B. *Algebraic method or Simultaneous Equation*: This method helps in finding out the amount of overhead of each service department by solving simultaneous equations. The total expenses of service departments can be directly transferred to the production departments.

Example

A company has three production departments, A, B and C and two service departments P and Q. The following figures are available as per departmental distribution summary:

		Rs.
Production	A	3,150
	B	3,700
	C	1,400
Service departments	P	2,250
	Q	1,000

The expenses of the service departments are to be apportioned on a percentage basis as follows:

As per summary		11,500	3,150	3,700	1,400	2,250	1,000
Service dept. P			1,000	750	500	-2,250	250
		11,500	4,150	4,450	1900	-	1,250
Service dept Q			375	375	250	250	-1,250
		11,500	4,525	4,825	2,150	-	-

Service department's overheads represent the sum of the service department costs plus the costs apportioned from other service departments. After obtaining total overhead costs of servicing department the total of each service department is apportioned to the producing departments on the basis of percentage or proportion (for the services rendered) of the specific producing departments.

Example

PH Ltd is a manufacturing company having three production departments A, B and C and two service departments X AND Y. The following is the budget for December 1999.

	Total Rs	A Rs.	B Rs.	C Rs	X Rs	Y Rs
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Direct material		1,500	2,000	4,000	2,000	1,000
Direct wages		5,000	2,000	8,000	1,000	2,000
Factory rent	4,000					
Power	2,500					
Depreciation	1,000					
Other overheads	9,000					
Additional information						
Area (sq.ft.)		500	250	500	250	500
Capital value (Rs. Lakhs) of assets		20	40	20	10	10
Machine hours		1,000	2,000	4,000	1,000	1,000
Horse power of machines		50	40	20	15	25

A technical assessment of the apportionment of expenses of service departments is as under:

	A	B	C	X	Y
	%	%	%	%	%
Service dept X	45	15	30	-	10
Service dept Y	60	35	-	5	-

Required

- (viii) A statement showing distribution of overheads to various departments
- (ix) A statement showing re-distribution of service departments expenses to production departments and
- (x) Machine hour rates of the production department A,B and C

Table 7.18 Solution: Overhead Distribution Summary

	Basis	Total Rs	A Rs.	B Rs.	C Rs	X Rs	Y Rs
Direct Material	Direct	-	-	-	-	2,000	1,000
Direct wages	-	-	-	-	-	1,000	2,000
Factory rent	Area	4,000	1,000	500	1,000	500	1,000
Power	H.P.X	2,500	500	800	800	150	250
Depreciation	M/chr	1,000	200	400	200	100	100
Cap.	Value	9,000	1,000	2,000	4,000	1,000	1,000
Overheads	M/c hr						
			2,700	3,700	6,000	4,750	5,250

Table 7.19 Re-distribution of Service Department's Expenses

	A Rs.	B Rs.	C Rs	X Rs	Y Rs
Total overheads	2,700	3,700	6,000	4,750	5360
Dept. X Overheads apportioned In the ratio (45:15:30:10)	2,138	712	1,425	-4,750	475
Dept. Y Overhead apportioned In the ratio (60:35:5)	3,495	2,039	-	291	-5825
Dept. X Overheads apportioned In the ratio (45:15:30:10)	131	44	87	-291	
Dept. Y Overhead apportioned In the ratio (60:35:5)	17	10	-	2	29
Dept. X Overheads apportioned In the ratio (45:15:30:10)	1	-	1	-2	29
	8,482	6,505	7,513	-	-

Machine Hour Rate

	A	B	C
Machine hours	1,000	2,000	4,000
Machine rate (Rs.)	8.48	3.25	1.88

STAGE IV: CALCULATION OF OVERHEAD RATES

After all services departments' overhead costs have been apportioned to the producing departments, the next step is to spread factory overhead to different products or jobs produced. This is termed as '*overhead absorption*' in cost accounting. Known by different names such as recovery, overhead application, overhead costing, levy, burden rate etc. the term "absorption" implies that expenses pertaining to a producing department or cost centre are finally charged to or absorbed in the cost of products, jobs, etc. passing through it. As a result of absorption, the cost of each unit of product of the producing department includes an equitable share of the total overhead of that department. Overhead rates can be calculated by using any one of the following methods:

1. Percentage on Direct Materials

In such a case, the rate is obtained by dividing total estimated factory overhead by total direct materials cost expected to be used in the manufacturing process. If factory overhead is Rs. 3, 00,000 and materials cost is Rs. 2, 50,000, the absorption rate will be:

$$3,00,000/2,50,000 \times 100 = 120\%$$

Each job or product would be charged on the basis of 120% absorption rate. For example, if the materials cost of a product is Rs. 5,000, the factory overhead to be charged for their product would be Rs. 6,000 (5,000 x 120%).

Advantages

The percentage on direct material cost method is simple and easy to understand and apply. This method will give correct overhead cost figures where the price of raw materials do not differ significantly, where quantity and cost of materials in each product are unit form, and where processing for the different products is also uniform. It is useful in very simple types of small business firms.

Disadvantages

This method has the following disadvantages:

- There is no logical relationship between materials cost of a product and factory overhead used in production
- Materials prices are subject to fluctuations quite often and this phenomenon leads to high or low overhead costs, even though overhead figures remain unchanged.
- Most of the overhead expenses vary with time and not on materials consumed. But the use of direct material cost totally ignores the time factor which is an important factor in allocation/apportionment of overhead costs.
- The mere fact that a job consumes materials of a very expensive nature does not imply that the overheads incurred on that job will also be heavier.

2. Percentage on Direct Wages

The direct labour cost basis is the most widely used method of applying overhead to jobs or products.

This is computed in the following manner:

$$(\text{Factory overhead}/\text{Direct labour cost}) * 100$$

If factory overhead is Rs. 20,000 and the direct labour cost is also Rs. 20,000, then absorption rate based on direct wages will be 100%.

$$20,000/20,000 * 100$$

A job or a product with a direct labour cost of Rs. 3,000 would be charged with Rs. 3,000 for factory overheads. Labour rates fluctuate but less frequently than that of prices of materials

Advantages

- It is simple to operate and understand.
- It considers the time factor, as labour cost is computed by multiplying the number of hours spent on work by an hourly labour rate, the more hours worked, the higher the greater the use and therefore the charge for factory overheads.
- Labour cost and the greater the use and therefore the charge for factory overheads.

Disadvantages

The disadvantages are:

- It depends on the cost of direct labour which may not reflect accurately the contribution of factory overheads in the cost of product.
- It does not consider the share of other factors of production other than direct labour factor, for example, machinery.
- It does not take into account variations, if any, in the rates of remuneration for different types of labour and therefore, the wages incurred on different jobs are not necessarily in the same ratio as the hours spent.

3. Prime Cost Percentage

The prime cost basis combines the total of direct materials cost and direct labour cost and uses this total as a basis for charging overhead. The formula used in determining the rate is:

$$(\text{Factory Overhead} / \text{Prime cost}) * 100$$

If in a case, the factory overhead is Rs. 4, 56,000 and prime cost is Rs. 6, 00,000, then prime cost. Percentage rate will be:

$$(4, 56,000 / 6, 00,000) * 100 = 76\% \text{ or prime cost}$$

Advantages

This method is simple to operate. It considers both materials and labour in charging overheads to each job or product. The prime cost data is easily available without any additional problem of accumulation.

Disadvantages

The disadvantages are:

- Two items, *i.e.* materials and labour both of which possess many disadvantages influence the charging of factory overheads to jobs and products.
- Where the cost of materials is a larger part of the prime cost, the time factor (direct labour costs) will be ignored which is more related to the factory overhead.

- It ignores the time factor in absorbing factory overhead.

4. Unit of Production Basis

The unit of production method is the simplest and most direct method of charging factory overhead. The unit might be a kilo, foot, a machine, a hundred pieces or whatever unit of measure is used for the product. As a formula, the computation is as follows: $\text{Factory overhead} / \text{Units of Production}$

If factory overhead is Rs. 3,00,000 and the company intends to produce 2,50,000 units during the next period, each unit completed would be charged with Rs. 1.20 ($3,00,000 \div 2,50,000$ units) as its share of factory overhead. Thus, an order with 1,000 completed units would be charged Rs. 1,200 (1,000 units x Rs. 1.20) for factory overhead.

5. Labour Hour/Production Hour Rate

One of the most widely used methods for overhead application is the labour hour basis. The equation for determining the overhead rate under this method is:

= $\text{Factory overhead} / \text{Direct labour hours}$

If factory overhead is Rs. 4,00,000 and direct labour hours are 2,00,000, then the overhead rate based on direct labour hours would be Rs. 2 per hour of direct labour (Rs. $4,00,000 \div 2,00,000$ hours). A product that requires 5,000 direct labour hours would be charged with Rs. 10,000 (5,000 hours * Rs. 2) for factory overhead.

Advantages

The following are the advantages:

1. As long as direct labour is the chief factor in manufacturing processes, the direct labour hour's method is useful as the most equitable basis for charging overheads.
2. This method uses the time factor and production taking into account that the same time is charged with the same amount of overhead, though the direct laborer may be getting different wage rates.

Disadvantages

The disadvantages are:

1. The method requires accumulation of direct labour hours by job, product or department. Timekeeping should be adequate to provide this information.
2. This method cannot be used where machines are used extensively for production. In other words, this method assumes that direct labour is only the major factor of production.

6. Machine Hours Rate

The machine hour rate is similar to the labour hour rate method and is used where the work is performed primarily on machines. The formula used in computing the rate is:

$$= \text{Factory overhead} / \text{Machine hours}$$

If factory overhead is Rs. 3, 00,000 and total machine hours are 1, 50,000, the machine hour rate is Rs. 2 per machine hour (Rs. 3, 00,000 ÷ 1, 50,000 hours).

Advantages

The method can be used advantageously where the machine is the major factor in production. In capital-intensive industries, plants and machines are used in large quantities and one operator may attend to several machines or several operators may attend to a single machine. By making the machine the basis, therefore, overhead costs can be equitably absorbed among different products.

Disadvantages

The disadvantages are:

1. Machine hour data has to be collected and therefore it requires additional clerical work.
2. The method cannot be used universally by all business concerns. It can be used where production is mainly through machines.

Two types of machine hour rates can be calculated:

1. *Ordinary machine hour rate*-This rate takes into account only those overhead expenses which are directly attributed to the running of a machine. Such expenses are power, fuel, repair, maintenance and depreciation. The total of all these expenses is divided by the total machine hours.

2. *Composite machine hours rate*-This method takes into account not only expenses directly connected with the machine as mentioned above, but also other expenses which are known as *standing* or *fixed charges*. Such expenses are rent and rates, supervisory labour, lighting and heating, etc. These expenses being fixed in nature are determined for a particular period and then apportioned among different departments on some equitable basis. The overhead expenses thus apportioned to each department are further apportioned among the machines (machine cost centers) in that department on an equitable basis.

7.6 MANAGERIAL ACCOUNTING

Managers in all types of organizations need frequent information about business activities to plan accurately for the future, to control business results, to direct an enterprise towards achieving its goals and to make decisions that affect the operations of the business. Information is vital for the management process i. e. for functions carried out by the managers namely, planning, controlling and decision-making. In the goal of providing

information, managerial accounting identifies, collects, measures, classifies and reports - information that is useful to managers in fulfilling the management process.

Managerial accounting is that field of accounting which deals with providing information including financial accounting information to managers for their use in planning, decision-making, performance evaluation, control, management of costs, and cost determination for financial reporting. Managerial Accounting contains reports prepared to fulfill the needs of managements.

The National Association of Accountants (USA), in Statement No. IA (Statements on Management Accounting, 1982) has defined management accounting as:

“... The process of identification, measurement, accumulation, analysis, preparation and communication of financial information used by management to plan, evaluate, and control within the organisation and to assure appropriate use and accountability for its resources.”

The CIMA (UK) defines the term management accounting in the following manner:

"Management accounting is an integral part of management concerned with identifying, presenting and interpreting information used for:

- (1) Formulating strategy
- (2) Planning and controlling activities
- (3) Decision taking
- (4) Optimizing the use of resources
- (5) Disclosure to shareholders and others external to the entity
- (6) Disclosure to employees and
- (7) Safeguarding assets."

Thus, managerial accounting is concerned with data collection from internal and external sources, analysis, processing, interpreting and communicating the information for use within the organisation so that management can more effectively plan, make decisions and control operations.

COST ACCOUNTING AND MANAGERIAL ACCOUNTING

Cost accounting is mainly concerned with ascertainment of product costs and the techniques of product costing and deals with only cost and price data. It is limited to product costing procedures and related information processing. It helps management in planning and controlling costs relating to both production and distribution activities.

In spite of the differing parameters of cost accounting and managerial accounting, cost accounting is generally indistinguishable from what is known as management or *managerial accounting*. Both these accounting systems are closely linked as they use common basic data and reports to a material degree. Much of the information used to prepare accounting statements and reports in cost accounting are also used in managerial accounting reports. Cost accounting largely uses data about production, sales, wages, and overhead services. Managerial accounting utilises the same (and also additional) data to prepare budgets, performance reports, and control reports and data analyses for decision-making purposes. Special decision methods, use of highly quantitative methods, behavioral techniques, information systems and budgeting are areas of managerial accounting. Gray and Ricketts I illustrate the relationship between cost accounting and managerial accounting in these words:

"The database (for cost accounting and managerial accounting) includes common data, *i.e.* the same data are used, by managerial accounting and by cost accounting, but in different ways. For example, historical data on labour costs are used by cost accounting to determine inventory values and cost of goods sold. The historical data on labour cost might be used to estimate the labour cost for the coming year to determine the size of workforce needed to meet anticipated production requirements and to estimate the cash requirements to meet weekly payrolls. This represents the use of cost accounting data to develop managerial accounting data for planning decisions. The historical data on labour costs might be compared with the estimated labour costs to determine if labour is being used effectively and efficiently. This represents the use of cost accounting data to develop managerial accounting data for control decisions. The data base also include ... special data for cost accounting and special data for managerial accounting, obviously called special because they are data used only by either cost accounting or by managerial accounting."

MANAGEMENT PROCESS AND ROLE OF MANAGERIAL ACCOUNTING

The Management process implies the four basic functions of (1) Planning, (2) Organizing 3) Controlling, and (4) Decision-making. Managerial accounting plays a vital role in these managerial functions performed by managers.

(1) Planning: Planning is formulating short term and long-term plans and actions to achieve a particular end. The long-term plan indicates management's expectation of the future during the next three to five years or perhaps even longer. A budget is the financial planning showing how resources are to be acquired and used over a specified time interval. Managerial accounting is closely interwoven in planning both because it provides information for decision-making and because the entire budgeting process is developed around accounting-related reports. Managerial accounting helps managers in planning by providing reports which estimate the effects of alternative actions on an enterprise's ability to achieve desired goals. For example, if a business enterprise determines a target profit for a year, it should also determine how to reach that target. For example, what products are to be sold at what prices? The management accountant develops data that help managers identify the more profitable products. Similarly, the effects of alternative prices and selling efforts (say, what will profit be if we cut prices by 5% and increase volume by 15%, etc.) can easily be determined by the management accountant.

(2) Organizing: Organizing is a process of establishing an organizational framework and assigning responsibility to people working in an organisation for achieving business goals and objectives. The type of organizational structure differs from one business enterprise to another. Organizing requires clarity about each manager's responsibility and lines of authority. The various departments and units are inter-related in a hierarchy, with a formal communication structure in which information and instructions are passed downwards to the lower level management and upwards to the top management level.

Managerial accounting helps managers in organizing by providing reports and necessary information to regulate and adjust operations and activities in the light of changing conditions. For example, the reports under managerial accounting can be

prepared on product lines on which basis managers can decide whether to add or eliminate a product line in the current product mix. Similarly, the management accountant can provide sales report, production report to the respective managers for taking suitable action about the sale and production position.

(3) *Controlling*: Control is the process of monitoring, measuring, evaluating and correcting actual results to ensure that a business enterprise's goals and plans are achieved. Control is accomplished with the use of feedback. Feedback is *information that can be used to evaluate or correct the steps being taken to implement a plan*. Feedback allows managers to decide to let the operations and activity continue as they are, take remedial actions to put some actions back in harmony with the Original plan and goals or do some rearranging and preplanning at the midstream.

Managerial accounting helps in the control function by producing performance reports and control reports which highlight variances between expected and actual performances. Such reports serve as a basic for taking necessary corrective action to control operations. The use of performance and control report follows the principle of management by exception. In case of significant differences between budgeted and actual results, a manager will usually investigate to determine what is going wrong and possibly, which subordinates or units might need help.

(4) *Decision-making*: Decision-making is a process of choosing among competing alternatives. Decision-making is inherent in each of three management functions described above, namely planning, Organizing and controlling. Before knowing the role of the management in the decision-making area. It is first necessary to understand the decision-making process. The decision-making process includes the following steps: 2

- Identifying a problem requiring managerial action.
- Specifying the objective or goal to be achieved (e.g. maximizing return on investment).
- Listing the possible alternative courses of action.
- Gathering the information about the consequences of each alternative.

- Making a decision, by selecting one of the alternatives.

Decision-Making Process

Managerial accounting plays a critical role in step 4 of the decision-making process. Managerial Accounting. System contains a storehouse of valuable information for predicting the results of various courses of action. The managerial accounting can assist the management in formally structuring decision. Problems as well as placing the alternatives and their consequences in a form that will be easier for the management to evaluate. It should be understood that the management accountant sometimes needs to do special analyses and develop information for some decisions which are made at relatively infrequent intervals, such as whether, to build a new factory, introduce a new product or enter a foreign market. The data for such decisions and analyses may be readily available in the needed form. The management accountant in such a situation. determines what data are needed, presents those data in an understandable form and manner and explains the analyses and report to the managers who are to make decisions.

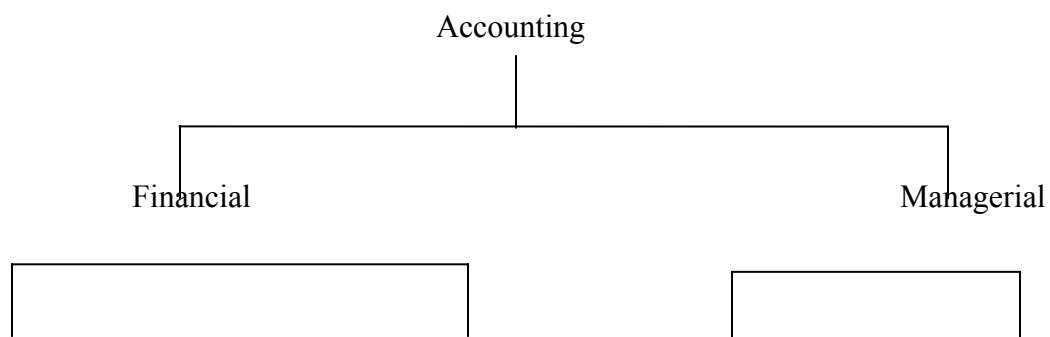
While developing and gathering information for decision-making purposes, the management accountant should include qualitative information also in his report to help managers better in their decision-making tasks. Dominiak and Londerback III observe: "Although managers use accounting data 'extensively as they make decisions, such data do not answer the questions that managers face. People make decision and people bring to decision making their experience, values and knowledge which often cannot be incorporated into quantitative analyses. An action that seems based on an analysis of the accounting data might not be taken because of some factor not captured in those data. For example, because the managers of a firm want the company to maintain technological leadership, they might launch a new product that is expected to be unprofitable. Quantifying the benefits of such leadership is not easy. It is unlikely that such quantification would be included in the management accountant's analysis of the desirability of bringing out the new product. It is, however, quite likely that a report of that analysis would include a comment about the inability to quantify such benefits. That is, reports from managerial accountants are very likely to recognize factors whose financial implications are not incorporated in the reports."

7.6.1 DIFFERENCES BETWEEN MANAGERIAL ACCOUNTING AND FINANCIAL ACCOUNTING

The accounting information system in an organisation can be divided into two important subsystems or branches: (i) Management or Managerial Accounting and (ii) Financial Accounting. As stated earlier, managerial accounting, also known as internal accounting, identifies, collects, measures, classifies and reports information that is useful to managers in planning, control and decision-making. On the other hand, financial accounting, also known as external accounting, produces information and reports for external users. The subject matter and scope of managerial accounting and financial accounting are displayed in Figure 7.2.

Managerial accounting and financial accounting differ from each other in the following respects:

(1) Primary users of information: The users of financial accounting statements are mainly external to the business enterprise. The financial statements prepared under financial accounting show how the resources have been used by a business enterprise during a specific period of time and thus are useful to external users in making sound economic decisions. These financial statements are relevant to management but are not adequate for the purpose of planning, control and decision-making. External users include shareholders, creditors, financial analysts, government authorities, stock exchange, labour unions etc.



Internal Reporting	Interested Parties or Users	Internal Reporting	Interested parties
Income Statement	Shareholders	Planning	Management (or Managers)
Balance Sheet	Investors	Decision-making	Top
CashFlow Statement	Creditors	Performance Evaluation	Middle
	Government Authorities	Control	Lower
	Managers	Management of Cost	
	Employees	Cost determination	
	Stock Exchange		
	Investor's Association		
	Industry Association		

Fig 7.2 Accounting classification

Management accounting aims at preparing reports and supplying information to the management for planning, controlling and decision-making. The information generated under the accounting system is used by members of the management at different levels. The nature of internal reports and data varies for different levels of management in conformity with their information requirements for analysing business operations and for planning and control purposes.

(2) Accounting methods: Financial accounting follows the double-entry system for recording classifying and summarizing business transactions. This accounting process results in aggregate balance of all accounts maintained in a firm's books. Managerial accountings are not based on the double-entry system. The data under managerial accounting may be gathered for small or large segments or activities of an organisation and monetary as well as other measures can be used for different activities in the firm.

(3) Accounting principles: Financial accounting data is primarily meant for external users. The generally accepted accounting principles' are important in financial accounting and are used extensively while recording, classifying, summarizing, and

reporting business transactions. The use of GAAP adds credibility and reliability to financial statements and creates confidence among the financial statement users. On the contrary, managerial accounting is not bound to use the generally accepted accounting principles. It can use any accounting technique or practice which generates useful information. Besides data developed in management accounting may be facts, estimates, projections, analysis etc.

(4) Unit of measurement: All information under financial accounting is in terms of money. That is transactions measured in terms of money have already occurred. In comparison, managerial accounting applies any measurement unit that is useful in a particular situation. Besides the monetary units, the management accountant may find it necessary to use such measures, as number of labour hours, machine hours and product units for the purpose of analysis and decision-making. The common objective in all measurement, reporting and data analysis in managerial accounting is *usefulness* for a particular purpose.

(5) Time Span: Financial accounting data and statements are developed for a definite period, usually: a year or a half-year. It requires that financial statements be developed and presented at regular time intervals. Company annual reports may be prepared semi-annually or quarterly but the important point is that they are prepared on a regular basis.

Managerial accounting reports and statements are prepared whenever needed. Reports may be prepared on a monthly, weekly or even daily basis. Frequency of reports is determined by particular planning controlling and decision-making needs.

(6) General Purpose Report vs. Specific Purpose Report: Financial accounting produces information and reports which are general purpose reports in order to serve the informational needs of many external users such as shareholders, creditors, potential investors, customers, suppliers, regulatory authority's employees and the general public. On the contrary, the reports and data developed in managerial accounting are known as specific purpose reports designed for a particular user (manager) or particular decision. Managerial accounting uses internal reports to evaluate the performance of entities,

product lines, departments and managers.

(7) **Historical vs. Futuristic Data:** Financial accounting has a historical orientation and records and reports what has happened. Financial accounting concentrates on the results of past decisions. Managerial accounting has a futuristic orientation and concentrates on what is likely to happen in the future. This is due to the fact that managerial accounting emphasizes on developing information for planning, control and decision-making purposes. Therefore, managerial accounting focuses on the future more than financial accounting.

(8) **Detailed and aggregated information:** Managerial accounting provides detailed and disaggregated information about products, individual activities, divisions, plants, operations, tasks or any other responsibility centers. On the other hand, financial accounting focuses on the company as a whole. Sometimes, in financial accounting, some information is given about different products or lines of activity due to financial reporting requirements as provided in the Companies Act/other rules and regulations.

(9) **Use of disciplines:** Managerial accounting uses other disciplines to prepare the most useful reports and analyses for the managers. Some such disciplines are economics, finance, management, information system, industrial engineering, operations research, marketing, computer science, production management, statistics, psychology and sociology etc. In this way, managerial accounting is much broader than financial accounting.

Despite the above differences between managerial and financial accounting, there are some similarities between the two accounting systems. Both managerial accounting and financial accounting are part of the total accounting information system. Both deal with economic events. Both try to quantify the results of economic activity and transaction. Both are concerned with financial statements, revenues, expenses, assets, liabilities and cash flows. The accounting information system that accumulates and classifies information and generates financial statements is the same system used for many reports

and analysis which are prepared under managerial accounting. Further, the reports prepared in management accounting and financial accountings are based on the same databases which are originally created to fulfill the accounting and reporting requirements of financial accounting. This is the reason that when the accounting system in an organisation collects and classifies information, it does so in a manner and format which can be appropriate for both the accounting systems. To achieve this dual purpose in developing the database, many business enterprises expand this database so as to fulfill adequately the informational needs of their managers and decision-makers. For example, investors and other users are primarily interested in the overall profitability of a company. However, the managers within the company are more interested in the profitability of individual products. In this situation, the accounting system can be developed and designed so as to provide both total company profits as well as profits for the individual products. The vital point about the accounting system is the flexibility that is, the accounting system should be flexible to provide different data to different persons for different purposes.

Managerial and financial accounting are also similar with regard to determination and measurement of costs, their assignment to different accounting periods and allocation of costs to different departments and segments. The concepts and principles which are used in the areas of financial accounting for the purposes of cost accumulation and cost allocation may also be suitable for management accounting as well. It means any method, principle or concept which are developed for financial accounting, can be used for Preparing reports and analyses in management accounting if they are found useful for managerial purposes.

7.6.2 COST-VOLUME-PROFIT ANALYSIS

Cost- Volume-Profit (CVP) analysis is an important tool that provides the management with useful information for managerial planning and decision-making. Profits of a business firm are the result of interaction of many factors. Such factors determine whether we have profits or losses and whether profits increase or decrease over time. Among the many factors influencing the level of profits, the following are considered the key factors:

- (i) Selling price
- (ii) Volume of sales
- (iii) Variable costs on a per unit basis
- (iv) Total fixed costs and
- (v) Sales mix (proportions or combinations in which different products are sold).

To do an effective job in planning and decision-making, the management must have analyses which allow reasonably correct predictions of how profits will be affected by a change in anyone of these factors. Also, management needs an understanding of how revenues, costs and volumes interact in providing profits. All these analyses and information are provided by cost-volume-profit analysis.

Cost- Volume-Profit analysis is a systematic method of examining the relationships between selling price, total sales revenue, and volume of production, expenses and profit. This analysis simplifies the real world conditions that a business enterprise is likely to face. CVP analysis can play an important role by providing the management with information regarding financial results if a specified level of activity or volume fluctuates, information on relative profitability of its various products, information on probable effects of changes in selling price and other variables. Such information can help the management improve the relationship between these variables. For example, an analysis of sales and cost data can be helpful in determining the level of sales volume necessary for the business to achieve a desired or target profit. Similarly, CVP analysis may be used in setting selling prices, selecting the products mix to sell, choosing among alternative marketing strategies and analysing the effects of cost increase or decrease on the profitability of the business enterprise.

CVP analysis focuses on prices, revenues, volume, costs, profits and sales mix and on the interrelationship between them during the short-run. The short-run is generally considered a period of one year or less than one year during which the production of a business enterprise cannot be increased and is limited to the available current operating capacity of the enterprise. During the short-run, the capacity of the plant and machinery cannot be increased (this is possible during the long-term only) and therefore, production is limited in terms of available plant facilities. Similarly, it takes time to reduce the capacity of plant and machinery and therefore, a business enterprise should operate

during the short-run relatively on a constant quantity of production resources. Besides, no changes in cost and prices data can be generally made during the short-term as they might have already been determined. During the short-run, however, some resources like materials and unskilled labour can be increased at a short notice. Thus during the short run, sales volume and short-run profitability can be the only vital area which may be found uncertain. CVP analysis herein reveals the effect of changes in sales volume on the level of profits. CVP analysis, in this way, is an integral part of financial planning and managerial decision-making.

In CVP analysis, all expenses are classified into fixed and variable. Semi-variable expenses have to be divided into their fixed and variable elements. These steps are important prerequisites to any CVP analysis and a proper understanding of them is essential for reliable conclusions. Based upon a knowledge of fixed and variable cost elements and CVP analysis, it is possible to determine break-even sales volume, to compute the sales needed to generate desired profits and to supply answers to many questions that arise in the course of management planning and decision-making.

TECHNIQUES OF CVP ANALYSIS

CVP analysis uses the following techniques or analyses while answering to many questions in the area of managerial planning and decision-making:

- (1) Contribution Margin Concept
- (2) Break-Even Analysis
- (3) Profit-Volume (P/V) Analysis

CONTRIBUTION MARGIN CONCEPT

Contribution margin concept indicates the profit potential of a business enterprise and also highlights the relationship between cost, sales and profit. It is a highly useful technique for planning and decision making by the management.

Contribution margin is the excess of sales revenue over variable costs and expenses. Under contribution margin concept, variable costs include all variable costs, *i.e.* variable production costs and variable selling and administrative expenses, if any. From the contribution margin, fixed costs and expenses are deducted giving finally operating

income or loss. Contribution margin is thus used to recover/cover fixed costs. Once the fixed costs are covered, any remaining contribution margin adds directly to the operating income of the firm. Contribution Margin Ratio (Also known as CIS ratio or P/V ratio)

The contribution margin can also be expressed in the form of a percentage. The contribution margin ratio is also known as 'contribution to sales' (C/S) ratio or profit-volume (PN) ratio. This ratio denotes the percentage of each sales rupee available to cover the fixed costs and to provide operating income to a firm. Taking an example, assume the following information in case of a company.

Sales	1, 00,000
Variable Costs	60,000
Fixed Costs	30,000

In this case, contribution margin is Rs. 40,000; profit Rs. 10,000 and contribution margin is 40% as shown by the following computation:

(i) Sales	1, 00,000
Variable costs	60,000
Contribution margin	40,000
Fixed Costs	30,000
Profit	Rs. 10,000

(ii) Contribution Margin Ration (or C/S or P/V Ration)

$$= \frac{\text{Sales} - \text{Variable Costs}}{\text{Sales}}$$

$$= \frac{\text{Rs. 1, 00,000} - \text{Rs 60,000}}{\text{Rs.1, 00,000}}$$

$$= \frac{\text{Rs.40, 000}}{\text{Rs.1, 00,000}} = 40 \%$$

The P/V ratio helps in knowing the effect on income of a firm due to increase or decrease in sales volume. For instance, in the above example, a business enterprise may

be interested in studying the effect of having additional sales of Rs. 40,000 on the income of the firm. Multiplying the P/V ratio (40%) by the change in sales volume (Rs. 40,000) indicates an increase in operating income by Rs. 16,000 if additional sales are possible. The total income will be Rs. 26,000 as is clear from the following computation:

	(Rs.)
Sales	1, 40,000
<i>Less:</i> Variable costs (Rs. 1, 40,000 x 60%)	84,000
Contribution margin	56,000
(Rs. 1, 40,000 x 40%)	
<i>Less:</i> Fixed costs	30,000
Net Income	26,000

In the above example, variable costs as percentage are 60% of sales (100 - P/V ratio which is 40%). Thus, variable costs, as a percentage of sales are always equal to 100% minus the P/V ratio.

The P/V ratio is useful to the management in deciding whether to increase sales volume. For example, if the P/V ratio of a business enterprise is large and the enterprise is operating at less than 100% capacity, it will be advantageous for the firm to go for increase in sales volume as net income will go up because of higher sales volume. On the other hand, a firm with a small P/V ratio will not find profitable to have increase- in sales volume much profitable. Infact, enterprises having a lower P/V ratio should aim at reducing costs and expenses before thinking of increasing the sales volume.

The use of P/V ratio in specific analysis is based on the assumption that except sales volume, other factors such as the unit selling price, percentage of variable cost to sales, amount of fixed costs remain constant. If there are changes in any of these factors, the effect of such change should be considered in making the analysis involving the P/V ratio.

UNIT CONTRIBUTION MARGIN

Unit contribution margin or *contribution margin on per unit basis* is equally useful as it also indicates the profit potential of a product or activity. The unit

contribution margin is the money available from sale of each unit to cover fixed costs and provide profits to a firm. For example, if selling price of a company's product is Rs. 10 and variable costs per unit Rs. 6, the unit contribution margin will be Rs. 4 (Rs. 10 Rs. 6).

While the *P/V* ratio is most useful when the increase or decrease in sales volume is measured in terms of Rupees, the unit contribution margin is most useful when increase or decrease in sales volume is measured in sales unit (quantities). If a business firm has been able to cover fixed costs, the net income of the firm will increase by unit contribution margin multiplied by additional sales units.

7.6.3 BREAK-EVEN ANALYSIS

A *break-even analysis* is performed to identify the level of operations at which the .entity has covered all costs but has not yet earned any profit. The break-even point identifies the volume of activity at which total revenues equal total costs. This is an important point to the management because it represents a minimum acceptable level of operations and it indicates that profitable operations can only result when the level of activity exceeds the break-even point.

Break-even Analysis in Units

Break even analysis utilizes the contribution margin approach to compute net income, which splits costs into a fixed and variable classification. The break-even point in units can be computed by dividing total fixed costs (F) by the contribution margin provided by each unit.

$$\text{Break-even in units} = \frac{\text{Total fixed costs}}{\text{Contribution margin per unit}} = \frac{\text{FC}}{\text{S-VC}}$$

The contribution margin per unit is sales price per unit (S) less variable cost per unit (VC). An example will illustrate the use of this formula.

Example

SAX manufactures and sells one type of calculator called Model Q. Model Q sells for Rs. 400, and the variable expenses associated with it are Rs. 200 for manufacturing and Rs.

50 for selling. Fixed costs are Rs. 7, 50,000 for manufacturing and Rs. 1, 50,000 for selling and administration. How many units must be produced and sold in order to break-even?

Solutions:

Break-even point in units =

$$= \frac{\text{Fixed Cost}}{\text{Sale price per unit} - \text{Variable cost per unit}}$$

$$= \frac{\text{Rs.9, 00,000}}{\text{Rs.400} - \text{Rs 2.50}} = 6,000 \text{ units}$$

When the price exceeds the variable cost, as in the example above, each unit contributes something (Rs. 150) toward, covering fixed costs and providing a profit. The break-even point has been reached as soon as the cumulative amount of the contribution margin (6,000 x Rs. 150) equals the total fixed costs (Rs. 9, 00,000).

BREAK-EVEN CHARTS

A break-even chart is a graphical representation of the relationships between costs, revenues and profits. It is developed by plotting the total cost curve and total revenue curve on a piece of graph paper. The above example has been used to illustrate the construction. The revenue and cost curves are:

$$\text{Revenue} = \text{Rs. 400 (per unit)}$$

$$\text{Cost} = \text{Rs. 90, 0000 fixed costs} + \text{Rs. 250 (per unit variable costs)}$$

The break-even point is the point at which the total revenue curve intersects the total cost curve. Sales above this level will provide a profit, while sales below this level will result in a loss. The amount of the profit or loss is shown by the vertical distance between the total revenue and total cost curves.

BREAK-EVEN ANALYSIS IN SALES RUPEES

The concept of the break-even point does not change when the analysis is performed in sales rupees. The break-even point merely identifies the amount of sales rupees required to cover all costs but generates no profit.

Equation for Break-even point in Sales Rupees: One method of computing break-even in sales rupees is to compute break-even in units and multiply the number of units by the sales price per unit. However, sometimes it may not be convenient or efficient because of the way the data is given to first compute the break-even point in units. The break-even point in sales rupees equal to fixed costs divided by the contribution margin ratio.

Break-even point in sales Rupees =

$$\frac{\text{Fixed Costs}}{\text{Contribution margin ratio}}$$

For an amount of desired profit, the following formula is used:

$$\frac{\text{Fixed costs} + \text{Desired Profit}}{\text{Contribution Margin Ratio (CIS Ratio)}}$$

By definition, the contribution margin ratio is the ratio of the contribution margin to sales. The Contribution margin is the sale price minus variable costs and the ratio is computed by dividing contribution margin by the sales price.

$$\text{Contribution margin ratio} = \frac{\text{Sales price per unit} - \text{Variable cost per unit}}{\text{Sales price per unit}}$$

OR

$$\text{Contribution margin ratio} = \frac{\text{Total sales} - \text{Total Variable Costs}}{\text{Total Sales}}$$

Example

All time company manufactures and sells a watch at Rs. 250. Variable costs are Rs. 200 per unit and fixed costs total Rs, 100,000 per year. What is the required sales revenue for the company to break-even? The contribution margin ratio is first computed and then divided into the total fixed costs.

Solution:

$$\text{Contribution margin ratio} = \frac{\text{Rs, 250} - \text{Rs, 200}}$$

$$\text{Rs.250} \quad =20\%$$

Break-even point in sales Rs. = $\frac{1,00,000}{20\%}$ = Rs. 5,00,000

20%

BREAK-EVEN ANALYSIS FOR MULTIPLE PRODUCTS

The analysis so far has assumed that only one product was being produced and sold, which is not very realistic for most companies. Break-even analysis can still be performed in case of multiple products using either units of production or sales rupees by assuming that the company's sales mix will remain constant. Sales mix refers to the ratio or relative combination of each product's sales to total sales. It is the composition of total sales broken down among various products or product lines.

Example

Multi Products Company has three products labeled Model X, Model Y and Model Z. Sales on a monthly basis are expected to be as follows:

	<i>Model X</i>	<i>Model Y</i>	<i>Model Z</i>	<i>Total</i>
Units	1,000	1,500	2,500	5,000
Sales Ratio	20%	30%	50%	100%

Product mix is usually stated in a ratio, such as (2: 3: 5) for models X, Y and Z respectively. This means that for every 2 units of Model X that are sold, there are 3 units of model Y and 5 units of model Z. Another way of viewing sales mix is to consider a market basket that represents the average expected sales of a company. Within that basket, representing one product mix, multi products would have 2 units of model X, 3 units of model Y and 5 units of model Z, for a total of 10 units.

Break-even Analysis in Units for Multiple Products

A market basket approach is used to compute a break-even point in units. A market basket representing the average sales mix is developed. The contribution margin provided by the basket is used to compute the number of baskets that must be sold to break-even.

The number of individual products required to fill the baskets at the break-even point is then determined

Example:

Multi Products Company has a sales ratio of 2: 3: 5 for models X, Y and Z respectively. Total fixed costs for the year are Rs. 200,000. The sales price, variable costs and contribution margin associated with each product are as follows:

	Model X	Model y	Model Z
Sales price	Rs. 50	Rs.25	Rs.10
Variable costs	30	15	8
Contribution margin	Rs.20	Rs.10	Rs.2

Solution:

The average market basket is based on the sales ratio and consists of 10 units with a total contribution margin of Rs. 80 (2 x Rs. 20) + (3 x Rs. 10) + (5 x Rs. 2). The break-even point in market baskets is computed using the formula for break-even point in units.

$$X = \frac{\text{Rs.200,000}}{\text{Rs.80}} = 2500 \text{ baskets}$$

In order to fill 2,500 baskets, it will take the following amounts for each model.

Model X 5,000 units (2,500 x 2)

Model Y 7,500 units (2,500 x 3)

Model Z 12,500 units (2,500 x 5)

This, then, is the break-even point in units as long as the sales mix stays at 2: 3: 5.

Break-even Analysis in Sales for Multiple Products

The break-even point in sales for a multiple product entity can be computed by using an average contribution margin ratio. The average contribution margin ratio can be computed on a per unit basis or it can be developed from the income statement. In both cases, the fixed costs are divided by the average contribution margin ratio. The difference is in the level of aggregation in computing the average contribution margin ratio.

When the average contribution margin ratio is computed on a unit basis, the average

unit sale price is divided into the average unit contribution margin.

Example:

Using the data above for Multi Products Company, the average sale price is computed by multiplying the sales ratio by the sale price for individual products and totaling the results. The average contribution margin is computed in a similar manner and the contribution margin ratio is the average contribution margin divided by the average sale price.

$$\begin{aligned} \text{Average sale price} &= (20\% \times \text{Rs. } 50) + (30\% \times \text{Rs. } 25) + (50\% \times \text{Rs. } 10) \\ &= \text{Rs. } 22.50 \end{aligned}$$

$$\begin{aligned} \text{Average contribution margin} &= \\ &= (20\% \times \text{Rs. } 20) + (30\% \times \text{Rs. } 10) + (50\% \times \text{Rs. } 2) = \text{Rs. } 8.00 \end{aligned}$$

$$\begin{aligned} \text{Average contribution margin ratio} &= \\ &= (\text{Rs. } 8.00 \div \text{Rs. } 22.50) \times 100 = 35.555\% \end{aligned}$$

$$\begin{aligned} \text{Break-even point in sales} &= \\ &= \frac{\text{Rs. } 20,000}{35.555\%} = \text{Rs. } 56,250 \text{ per year} \end{aligned}$$

Example

ABC Company has twenty products and the contents of an average market basket are not known. They reported the following net income for January, 1999. The sales mix and costs for January are expected to continue throughout the coming year. Management was disappointed with the results and wants to know the sales level required to break-even.

	Rs.	
Sales	1, 20,000	100%
Variable costs	90,000	75%
Contribution margin	30,000	
Fixed costs	40,000	
Net income (loss)	(10,000)	

Solution:

The average contribution ratio is 25% (Rs. 30,000/Rs. 120,000) and the break-even points in sales are Rs. 160,000 (Rs. 40,000/25%). Assuming the product mix and costs remain the same as in January, ABC Company must sell Rs. 160,000 per month to break-even. Break-even analysis in sales is generally easier to compute than break-even analysis in units for multiple product entities because it does not require knowledge of the product mix and the average market basket. A contribution margin ratio can be developed from the income statement for use in the break-even analysis.

Margin of Safety

The margin of safety is the difference between budgeted (or actual) sales and break-even sales, expressed as a percentage of budgeted sales. In equation form:

$$\% \text{Margin of safety} = \frac{\text{Budgeted (or actual) sales} - \text{break even sales}}{\text{Budgeted sales}}$$

Assume in a company the actual sales are Rs. 60,000 and break-even sales are Rs. 48,000. Then the margin of safety is:

$$= \frac{60,000 - 48,000}{60,000} \times 100 \% = 20 \%$$

This means that if sales volume is 20% less than the actual sales volume, the firm would just breakeven. Managers use the margin of safety as an indication of the risk inherent in a particular sales goal. The simple presumption is that the greater the margin of safety, the lower the risk.

7.6.4 PROFIT-VOLUME GRAPH

A *P/V* graph is used in place of or along with a break-even chart. Profit and losses are given on a vertical scale and units of products, sales revenue or percentage of activity are given on a horizontal line. The horizontal line is drawn on the graph to separate profit from losses. The profit and losses at various sales levels are plotted and connected by the profit line. The break-even point is measured at the point where the profit line intersects

the horizontal line. P/V graph focuses entirely on the relationship between volume and profit. A P/V graph is more useful than the break-even chart because it shows the profit or loss directly rather than as the difference between the revenue and cost curves. However, the P/V graph does not clearly show how costs vary with activity.

Example

Selling price per unit Rs. 40

Variable cost per unit Rs. 25

Total fixed costs Rs. 90,000

The total fixed expenses and break-even point can be used to construct the profit volume graph. The total fixed expenses of Rs. 90,000 represent a Rs. 90,000 loss at zero sales volume. The break-even point represents the unit sales volume at which there is no loss and no profit (zero profits). As you can see, the profit line begins where the fixed expenses is shown as a loss on the vertical axis and moves upward and to the right at a rate equal to the contribution margin per unit, Rs. 15 per unit. The contribution margin per unit is the slope of the profit line. The steeper the slope/starting at the same fixed expenses of the profit line, the lower the break-even point.

Significance of Fixed Costs on Break-Even Point

The greater the fixed expenses, the higher will be the break-even point. In the short run, fixed costs cannot be immediately reduced to meet declining customer demands. Certain fixed costs remain fairly constant, such as taxes, insurance, rent or lease costs, depreciation, security and certain aspects of administration (accounting, supervision, and marketing). Most of the fixed costs are essential in order to maintain the facilities and environment of the organization. As sales revenue decreases and fixed costs remain fairly constant, the earnings will naturally decline accordingly because of the fixed cost impact. It is only logical to assume that an organization with greater fixed expenses must have larger sales revenues to break even. If sales revenue increases, however, the organization can increase its earnings position because the increased profit will more than offset the fixed costs needs.

ASSUMPTIONS IN BREAK-EVEN ANALYSIS

The following are the important assumptions in break-even analysis and break-even charts.

1. The total revenues of the enterprise change in direct proportion to changes in unit sales volume.
2. This is the same as assuming that the average selling price is constant.
3. The total expenses can be separated into variable expenses and fixed expenses per year.
4. The total variable expenses vary in direct proportion to changes in sales volume. This is the same as assuming the variable expense per unit is constant.
5. The total fixed expenses, within a relevant range of volume, do not change as sales volume changes.
6. For a multi-product firm, the sales mix remain constant for all volume levels under consideration.
7. Production volume and sales volume are equal; in other words, inventory changes do no effect profit.

ADVANTAGES OF BREAK-EVEN ANALYSIS

- Break-even analysis provides a useful tool in demonstrating the relationship and interaction of cost, volume, and profit. If properly utilized, it aids in establishing realistic profit objectives and operating budgets.
- It provides management with distinctive insight into the economic characteristics of its business, not only in terms of the fixed and variable expenses at varying sales volumes, but also of the break-even relationship and its effect on the firm due to changes in factors likely to have impact on the profit of a business enterprise.
- The Manager can advantageously employ 'what if' question to determine the anticipated results from contemplated managerial decisions. The break-even process may involve such planning questions as plant expansion," equipment modernization, change in product mix or sales prices and the introduction of new product lines.

- Management is often confronted with the decision to increase sales volume with an optimistic view towards enhancing profit. Profit enhancing is a possibility, provided costs are controlled within prescribed limits. The break-even technique can be an important tool in establishing expenditure constraints and control by adequate supervision.
- An important influence on profit is the product sales mix with variable gross margins. The breakeven chart can highlight problem areas requiring connective management action.

DISADVANTAGES OF BREAK-EVEN ANALYSIS

- Break-even analysis is not a remedy for all problems faced by a business firm. It cannot be used usefully without a thorough understanding of its concept and limitations.
- The break-even chart generally reflects a number of estimates and judgments, and the resultant data developed and their implication can be misleading. For example, measuring costs and sales volume at a particular output level may be an inaccurate method of assessment, particularly when the volume approaches the break-even point, which can change depending on operating circumstances.
- Usually, the break-even is developed at a point that represents a static position. Changes in relationship factors should be correctly and logically reflected in a revised chart or a series of charts.
- The improper understanding and usage of the charts can lead to inadequate decision making, inaccurate planning assumptions and possibly detrimental control actions.
- Fixed and variable expenses may be inaccurately segregated with the resultant effect on the break even position. Plotting sales as a function of production volume can be misleading, the assumption that sales equals production may not necessarily be true because of the build up or reduction of stocks of varying business cycles. Extreme care is needed in compiling homogenous and compatible data for the break-even analysis.)

7.7 BUDGETARY CONTROL

One of the primary objectives of management accounting is to provide information to the management for planning and control. Budgeting acts as a tool of both planning and control. Budgeting is formal process of financial planning using estimated financial and accounting data. The Institute of cost and Management Accountants (UK) define a budget as *"a financial and/or quantitative statement prepared and approved prior to a defined period of time, of the policy to be pursued during that period for purpose of attaining a given objective. It may include income, expenditure and the employment of capital."* The National Association of Accountants (USA) defines budgeting as *"the process of planning all flows of financial resources into, within, and from an entity during some specified future period"*.

BUDGETING AND FORECASTING

Sometimes the terms 'budgeting' and 'forecasting' are used interchangeably. Both terms have some similarities. For example, both relate to future events and involve prediction of something. The basic difference between budgeting and forecasting lies in degree of sophistication involved in the predictions used by them. According to the National Association of Accountants (USA), *"forecasting is a process of predicting or estimating a future happening "*. Forecasting is an essential part of the budgeting process. It pertains to estimating future events and their effects on the budget. It comes to an end after mere estimating. Budgeting is a process of preparing budgets and further control aspects are involved in its procedure Besides, forecasting can be made by a business for purposes other than budgeting, such as a forecast of general business conditions. Such forecasts are sometimes not used in budgeting.

CONCEPT OF BUDGETARY CONTROL

Budgetary control is a control measure in which the actual state of affairs is compared with the budget so that appropriate action may be taken with regard to any deviations before it is too late. Budgeting is thus merely a part of budgetary control. The Institute of Cost and Management Accountants (UK) defines budgetary controls as *"the establishment of budgets relating the responsibilities of executives to the requirements*

of a policy and the continuous comparison of actual with budgeted results either to secure by individual action the objective of that policy or to provide a basis for its revision." Briefly, the use of a budget to control a firm's activities is known as budgetary control. Budgetary control has the following *main objectives*.

1. To provide an organized procedure for planning. It provides a detailed plan of action for a business over a definite period of time,
2. To coordinate all the activities of various departments of a business firm in such a manner that the maximum profit will be achieved for the minimum use of resources.
3. To provide means of determining the responsibility for all deviations from the plan (Budget), and to supply information on the basis of which necessary corrective action may be taken. Thus budgetary control has the objective of controlling cost.

BUDGET PERIOD

The budget period is an important factor in developing comprehensive budgeting programmes. This is the period for which forecasts can reasonably be made and budgets can be formulated. The length of the budget period depends on the type of business, the length of the manufacturing cycle from raw materials, finished products, the ease or difficulty of forecasting future market conditions and other factors. However, a business enterprise generally prepares a short-range budget and a long-range budget.

Short – Range Budget

Short-range budget may cover periods of three, six or twelve months depending upon the nature of the business. Most manufacturing firms use one year as the planning period. Wholesale and retail firms usually employ a six-month budget which is related to their selling seasons. In determining the period of the short-range budget, the following factors should be considered:

- The budget period should be long enough to cover complete production of various products.
- For business of a seasonal nature, the budget period should cover at least one entire seasonal cycle.

- The budget period should be long enough to allow for the financing of production well in advance of actual needs. It should provide adequate time to arrange the funds for production and other purposes.
- The budget period should coincide with the financial accounting period to compare actual results with budget estimates and thus to facilitate better interpretation of the performances.

Long-range Budget

A long-range budget or planning is defined as a systematic and formalized process for purposefully directing and controlling future operations towards a desired objective for periods extending beyond one year. Long-range budgets or plans are neither described in precise terms, nor are they expected to be completely coordinated future budgets. They cover specific areas such as, future sales, future production, long-term capital expenditures, extensive research and development programmes, financial requirements and profit forecast. They evaluate the future implications associated with present decisions and help the management in making present decisions and select the most profitable alternative. Long-range budgeting does not eliminate risk altogether; it only reduces the risk to a level which does not hamper the production and achievement of company objectives. A business enterprise through budgeting is prompted to take a greater but manageable risk.

7.7.1 FIXED AND FLEXIBLE BUDGETING

Fixed Budgeting

The Institute of Costs and Management Accountants (UK) defines a fixed budget as the budget which is designed to remain unchanged irrespective of the level of activity actually attained. It is based on a single level of activity. A fixed budget performance report compares data from actual operations with the single level of activity reflected in the budget. It is based on the assumption that the company will work at some specified

level of activity and that a stated production will be achieved. It suggests that the budget is not adjusted. It acts as a target for the forthcoming period. It represents a point fixed in advance with which actual results are compared. Fixed budgets do not change when production level changes.

However, in practice, fixed budgeting is rarely used. The main reason is that actual output is often significantly different from the budgeted output. In such a case, the budget cannot be used for the purpose of cost control. The performance report may be misleading and will not contain very useful information. For example, if actual production is 12,000 units in place of the budgeted 10,000 units, the costs incurred cannot be compared with the budget which relates to different levels of activity. Since, in fixed budgeting, units are overlooked, a cost to cost comparison without considering the units may give misleading results, the performance report prepared under fixed budgeting merely discloses whether actual costs were higher or lower than budgeted costs. Therefore, the fixed budget is unable to provide useful information when actual output differs significantly from expected or budgeted output. The fact that costs and expenses are affected by fluctuations in volume limits the use of the fixed budget. If budgeted costs are compared with the actual costs at the end of the year, it will be difficult to infer how successful a business firm has been in keeping expenses within the allowed limits. Clearly, the idea of comparing performance at one activity level with a plan that was developed at some other activity level is nonsense from the viewpoint of judging how efficiently the manager has produced any given output.

Flexible Budgeting

A flexible budget is defined in the terminology of cost accounting, issued by the Institute of Cost and Management Association (UK) as "a budget which by recognizing the difference between fixed, semi-fixed and variable costs, is designed to change in relation to the level of activity attained."

A flexible budget is a budget that is prepared for a range, *i.e.* for more than one level of activity. It is a set of alternative budgets to different expected levels of activity. The

flexible budget is also known by other names, such as variable budget, dynamic budget, sliding scale budget, step budget, expenses formula budget and expenses control budget. The underlying principle of a flexible budget is that every business is dynamic, ever-changing and never static. Thus, a flexible budget might be developed that would apply to a 'relevant range' of production, say 8,000 units to 12,000 units. Under this approach, if actual production slips to 9,000 units from a projected 10,000 units, the manager has a specific tool (*i.e.* the flexible budget) that can be used to determine budgeted cost at 9,000 units of output. The flexible budget provides a reliable basis for comparisons because it is automatically geared to changes in a production activity.

A flexible budget provides information to managers for multiple levels of output in case actual output is different from the expected level. The performance reports at the end of the accounting period are compared with a budget based on the actual output attained during the period. A flexible budget has the following important features:

- (1) It covers a range of activity (output).
- (2) It is flexible, *i.e.* easy to change with variation in production levels.
- (3) It facilitates performance measurement and evaluation.

Steps in Flexible Budgeting

The following steps (stages) are involved in developing a flexible budget:

1. Decide the range of activity to which the budget is to be prepared.
2. Determining the cost behavior patterns (fixed, variable, semi-variable) for each element of cost to be included in the budget.
3. Selecting the activity levels (generally in terms of production) to prepare budgets at those levels.
4. Preparing the budget at each activity level selected by associating the activity level with corresponding costs. The corresponding costs to be attached with each activity level are determined in terms of their behavior, *i.e.* fixed, variable and semi-variable.)

7.7.2 TYPES OF BUDGETS

Budgets are the *end product* of the budgeting process. The numbers and types of budgets in a business enterprise depend on the size and nature of the business. However, in a manufacturing concern, the following budgets are generally prepared:

(A) Operating and Functional Budgets:

1. Sales budget
2. Production budget
3. Production cost budget
 - a. Direct materials budget
 - b. Direct labour budget
 - c. Factory overhead budget
4. Ending inventories budget
5. Cost of goods sold budget
6. Selling expense budget
7. Administrative expense budget
8. Budgeted income statement

(B) Financial Budgets

- a. Capital expenditure budget
- b. Research and development budget
- c. Cash budget
- d. Budgeted balance sheet
- e. Budgeted statement of changes in financial position

Sales Budget

The most important budget, which all other budgets are contingent upon, is the sales budget. All budgets, such as production budget, inventory budget, personnel budget, administration budget, selling and distribution budget and others are all affected by the sales budget and are dependent upon the revenue derived from sales. Therefore, the sales budget is the starting point in preparing other functional budgets. Developing a sales budget requires forecasting future sales levels. Figure 27.1 presents a specimen of a sales budget.

ABC Company Ltd.

Table. 7.20 Sales Budget for the Year Ending December 31, 1999

Products	Budgeted sales units	Budgeted sales price (Rs.)	Total (Rs.)
A	70,000	80,000	56,00,000
B	80,000	1,20,000	96,00,000
	1,50,000		1,52,00,000

Production Budget

After preparing the sales budget, the production budget is prepared. A production budget is stated in physical units. It specifies the number of units of each product that must be produced to satisfy the sales forecasts and to achieve the desired level of closing finished goods inventory. Essentially, the production budget is the sales budget adjusted for inventory changes as follows:

Units to produce = Budgeted sales + Desired closing inventory of finished goods - Beginning inventory of finished goods.

A specimen production budget is given in Fig. 27.2.

ABC Company

Table.7.21 Total Production Budget for the Month of December, 1999

	<i>Products</i>	
	<i>A</i>	<i>B</i>
Budgeted sales (units)	70,000	80,000
<i>Add:</i> Desired closing finished goods inventory	20,000	30,000
	90,000	1,10,000
<i>Less:</i> Beginning finished goods inventory	40,000	50,000
Units to be produced	50,000	60,000

The production budget deals with the scheduling of operations, the determination of volume and the establishment of maximum and minimum quantities of raw materials and finished goods inventory. Its summaries and details provide the basis for preparing the budgets of materials, labour and factory overheads.

Production Cost Budget

A production cost budget summaries the materials budget, labour budget, the factory overhead budget and may be expressed and analysed by departments and/or

products. A production cost budget, also known as a manufacturing budget is made up of three budgets: (i) materials, (ii) labour and (iii) factory overhead.

Direct Materials Budget

A direct materials budget indicates the expected amount of direct materials required to produce the budgeted units of finished goods. This budget specifies the cost of direct materials used and the cost of the direct materials purchased. Figure 27.3 explains the calculation of the net direct materials budget. The usage part of the direct materials budget determines the cost of purchases of direct materials.

ABC Company

Table. 7.22 Direct Materials Budget for the Year Ending December, 1999

A. Usage Budget	<i>Products</i>		<i>Talal</i>
	A	B	
Budgeted production in units	50,000	60,000	
Direct materials requirements			
Product A 5 kg per unit		x 5	
Product B 8 per unit			x 8
Direct materials usage (kg)	2,50,000	4,80,000	
Cost per kg	Rs. 1.00	1.50	
Cost of direct materials used	Rs. 2,50,000	Rs. 7,20,000	Rs. 9,70,000
B. Purchase Budget			
<i>Direct Materials (in kg)</i>			<i>Total</i>
	<i>A</i>	<i>B</i>	
Direct material usage	2,50,000	4,80,000	
Budgeted closing direct materials inventory	+ 50,000	+ 75,000	
Total requirements	3,00,000	5,55,000	
Beginning direct materials inventory	70,000	1,00,000	
Purchase of direct materials	2,30,000	4,55,000	
Cost per kg.	x Rs. 1.00	x Rs. 1.50	
Cost of purchase	Rs. 2,30,000	Rs. 6,82,000	Rs. 9,12,000

The direct materials budget is useful in the following ways:

- (1) It helps the purchasing department to prepare a schedule to ensure delivery of materials when needed.
- (2) It helps in fixing minimum and maximum levels of inventories in the stores department.
- (3) It helps the finance manager to determine the financial requirements to meet production targets.

The materials budget usually deals with direct materials only. Supplies and indirect materials are generally included in the factory overhead budget.

Direct Labour Budget

The labour budget estimates the labour, adequate in number and grades, to enable the production budget to be achieved. It is generally preferable to prepare a separate direct labour budget and to include indirect labour in the factory overhead budget. The labour budget for direct and indirect labour helps the personnel or employment department in determining the number and types of workers needed. If additional workers are not needed, the task of the personnel department is easy. However, when workers are to be recruited, the personnel department has to make plans in advance.

ABC Company

Direct Labour Budget for the Year Ending December, 1999

	Products		
	A	B	Total
Budgeted production requirements	50,000	60,000	
Direct labour hours per unit	3	2	
Total direct labour hours	1, 50,000	1, 20,000	2, 70,000
Direct labour cost per hour	Rs.5, 00	Rs.5.00	
Total direct labour cost (Rs)	7, 50,000	6, 00,000	13, 50,000

Factory Overhead Budget

The factory overhead budget is prepared on the basis of the chart of accounts which reflects different expenses accounts and which properly classifies expense accounts and details of the cost centers or departments. Although expenses can be

classified in a different manner such as natural classification and variability, the preparation of the factory overhead budget requires that expenses should be classified by departments since expenses are incurred by various departments. In this way, departmental heads should be held accountable for expenses incurred by their departments. Generally, the department heads prepare budgets for their respective departments for the budget period. However, they need considerable help and advice from the budget director in order to achieve production budget. After review by the budget committee, the departmental managers are asked to review and comment on any revisions before the budget is made final.

The following depicts the factory overhead budget wherein overhead costs have been classified into fixed and variable components.

ABC Company
Factory Overhead Budget for the Year Ending December, 1999
 (Based on budgeted capacity of 2, 70,000 direct labour hours)

Items cost	Direct labour Hours (Rs.)	Rate per direct labour hour	Total (Rs)
A. Variable factory overhead:			
(i) Suppliers	2, 70,000	1.00	2, 70,000
(ii) Repairs	2, 70,000	0.50	1, 35,000
(iii) Indirect	2, 70,000	1.00	2, 70,000
(iv) Others	2, 70,000	0.40	1, 08,000
Total variable factory overhead cost			7, 83,000
B. Fixed factory overhead cost:			
(i) Super vision		4, 00,000	
(ii) Depreciation		5, 50,000	
(iii) Property tax		2, 50,000	
(iv) Others		1, 77,000	
Total fixed factory overhead cost			13, 77,000
Total factory overhead cost			21, 60,000
Predetermined overhead rate = <u>Rs.21, 60,000</u>			

2, 70,000 hours

= 8.00 per labour hour

Ending Inventories Budget

An inventory budget can be prepared to find out the values of direct materials and finished goods inventory as shown below

ABC Company Ending Inventory Budget for the Year Ending December, 1999

	Rs.
Direct materials inventory	
Product A 50,000 kg x Rs.1.00 per kg	50,000
Product B 75,000 kg x Rs.1.50 per kg	1, 12,000
	1, 62,500
Finished goods inventory	
Product A 20,000 kg x Rs.25.00	5, 00,000
Product B 30,000 kg x Rs.30.00	9, 00,000
	14, 00,000

Cost of Goods sold Budget

After preparing direct materials, direct labour, factory overhead and ending inventory budgets, the cost of goods sold budget can be prepared. The cost of goods sold budget summarizes the entire above budget as show in below

ABC Company Cost of Goods sold Budget for the Year Ending December, 1999

	Rs	Rs
Direct materials		
Beginning inventory	2, 00,000	
Purchases	9, 12,500	
	11, 12,500	
Less: Closing inventory	1, 62,500	
Cost of direct materials used		9, 50,000
Direct labour		13, 50,000
Factory overhead		21, 60,000

Total factory cost	44, 60,000
Beginning finished goods inventory	25, 00,000
Total goods available for sale	69, 60,000
Closing finished goods inventory	14, 00,000
Cost of goods sold	55, 60,000

Selling Expenses Budget

Closely related with the sales budget is the selling and distribution cost budget which shows the budget costs of promoting sales for the budget period. It is also known as the *marketing expense budget*. The selling cost budget is made up of a number of cost items, some of which are fixed and some variable. The principal fixed expenses are salaries and depreciation; the principal variable expenses are commissions, travel, advertising and bad debts. The variable expenses vary directly with sales. A selling expense budget consists mainly of the following major items:

1. Sales representative (salaries, commissions, entertaining and traveling)
2. Sales office (office supplies, salaries, postage, telephone, rent and rates).
3. Publicity office (salaries, office costs, press, journals, televisions, cinema, samples, sundries). (4) Warehousing, packing and dispatch (salaries, packing wages, drivers' wages, vehicle costs, Sundries).

The following explain an annual selling expense budget classified according to fixed and variable expenses. The annual budget should be broken down on a monthly basis so that actual expenses can be compared with the budget monthly. Also, separate budgets for each of these expenses may be prepared especially in the case of a large company.

ABC Company

Selling Expenses Budget for the Year Ending December 31, 1999

Items	Cost (Rs.)	Total cost (Rs.)
(A) Variable selling expense		
(i) Sales Commission	35,000	

(ii) Salary and wages	40,000	
(iii) Advertising	15,000	
(iv) Traveling	22,000	1, 12,000
(B) Total variable selling expenses		
(i) Warehousing	60,000	
(ii) Advertising	30,000	
(iii) Marketing Manger's salary	60,000	
(iv) Depreciation	27,000	1, 77,000
Total selling expenses		2, 89,000

Administrative Expense Budget

The administrative expense budget covers the administrative costs for non-manufacturing business activities. Budgeting administrative expense is often difficult. Perhaps the first difficulty is in classifying certain costs as production or administrative. For example, costs like purchasing, engineering, personnel, research and development can be administrative as well as production. Unless such and other expenses are properly classified, their proper budgeting and subsequent control cannot be exercised. The second difficulty is in determining persons responsible for the incurrence and control of these costs. However, in order to accomplish the purpose of cost control in cost accounting, it is necessary that each item of cost -should be under the jurisdiction and control of a responsible person who is accountable for incurring the cost.

ABC Company

Administrative Expense Budget for the Year Ending December 31, 1999

Items	Amount (Rs.)	Amount (Rs)
(A) Variable administrative expenses		
(i) Supplies	35,000	
(ii) Clerical wages	60,000	

Total variable administrative expenses		95,000
(B) Fixed administrative expenses		
Directors remuneration	1,20,000	
(i) Legal charges	20,000	
(ii) Depreciation	25,000	
(iii) Salaries	30,000	
(iv) Rent	60,000	
(v) Postage, telephone etc	32,000	
Total fixed administrative		2, 87,000
Total administrative expense		3, 82,000

Budget Income Statement

Budgeted income statement summaries all the individual budgets, *i.e.* sales budget, cost of goods sold budget, selling budget and administrative expense budget. No new estimates are made; figures are taken from budgets previously prepared. This budget determines income before taxes. If the tax rate is available, net income after taxes can also be computed. The following exhibits a budgeted or project income statement.

ABC Company **Budgeted Income Statement for the Year Ending December, 1999**

		Rs
Sales		1, 52, 00,000
Cost of goods sold		55, 00,000
Gross Margin		96, 40,000
Selling expenses	2, 89,000	
Administrative expenses	3, 82,000	
		6, 71,000
Income before taxes		89, 69,000
Income taxes (assuming 50%)		44, 84,500
	Net Income	44, 84,500

Capital Expenditure Budget

The budgeting of capital expenditure is one of the most important areas of managerial decisions. Large sums of money and long period of time are often involved in this budget which therefore requires utmost care and sound judgment. Capital expenditures represent long-term commitments. Also, the benefits of capital expenditure spread over a long period of time. Generally, capital expenditures are relatively large in comparison with operating expenditures and have a long-term impact on the organisation and the business firm. The capital expenditure budget aims at minimizing errors while making capital expenditure decisions.

Capital expenditure budgets are prepared for both short and long-range projects depending on the requirements of the business firm. Short-range projects are implemented during the current accounting period; therefore, these provisions should be made in the current budget. Long-range projects are not executed in the current period; they are expressed only in general terms. They become budget commitments only when the time for their implementation approaches.

Cash Budgets

A cash budget contains detailed estimates of cash receipts' (cash inflows) and disbursement (cash outflows) for the budget period or some other specific period. Cash budgeting is extremely important since business operations require adequate cash to acquire materials and meet various expense and loan obligations. Therefore, planning cash flow is very useful for all types of organizations. The preparation of a cash budget has the following objectives:

- It indicates the effect on the cash position of seasonal requirements, large inventories, unusual receipts and slowness in collecting receivables.
- It indicates the cash requirements needed for a plant or equipment expansion programme.
- It points the need for additional funds from sources such as bank or sale of

securities and the time factors involved. In this connection, it might also exert a cautionary influence on plans for plant expansion leading to a modification of capital expenditure decisions.

- It indicates the availability of cash for taking advantage of discounts.
- It assists in planning the financial requirements of bond retirements, income tax installments and payments to pension and retirement funds.
- It shows the availability of excess funds for short-term or long-term investments.

Budgeted or Projected Balance Sheet

A projected balance sheet represents the expected financial position at a particular date. The projected balance sheet is prepared from the budgeted balance sheet at the beginning of the budget period and the expected changes in the account balances reflected in the operating budgets, capital expenditure budgets and cash budget. If any of the accounts or relationships among the accounts appearing on the projected balance sheet are not according to the management's requirements and objectives, the operating plan might have to be changed. For example, if a bank or financial institution requires a business firm to maintain a certain minimum current ratio and debt-equity ratio, the operating plan would have to be changed if these ratios are indeed too low. Furthermore, unfavorable ratios may decrease the value of company shares in the stock exchange and lower the credibility of the firm in the investment market. The projected balance sheet also automatically determines the arithmetical accuracy of other budgets since they are used in preparing the forecasted balance sheet.

Budgeted Statement of Changes in Financial Position

The projected statement of changes in financial position is usually prepared from data in the budgeted income statement and changes between the project balance sheet at the beginning of the budget period and projected balance sheet at the end of the budget period. This projected statement is very useful to the management- in the financial planning process)

7.7.3 MASTER BUDGET (OR COMPREHENSIVE BUDGET)

A master budget sometimes called a *comprehensive budget* is the summary or total budget package for a business firm. A comprehensive budget is a set of financial statements and other schedules showing the expected or proforma results for a future period. A comprehensive budget normally contains an income statement, a balance sheet, a statement of cash receipts and disbursements and schedules of production, purchases and fixed asset acquisition. The budget packages might have other components depending on the needs of the firm. A comprehensive budget is the end product of the budget-making process. A master budget is a tool for coordinating all the individual budgets of an organisation into an acceptable effective plan. It shows the budgeted profit and loss account for the budget period and the budgeted balance sheet at the end of the period.

Whether a business firm prepares specific operating budgets or a complete master budget, the depends on a number of factors. The primary reason is the need of the management at a particular time. For example, management may be more concerned with a single or specific aspect at a time, such as adequacy of the cash position. If the cash budget reveals that all is well, it may be the only budget needed to be prepared for the management's use. If the cash budget reveals an inadequate or poor cash position, then other budgets making up the master budget will have to be prepared. In this situation, new budgets or forecasts will continue to be prepared, unless the management finds an acceptable set of budgets

7.7.4 ZERO BASE BUDGETING (ZBB)

Zero Base Budgeting (ZBB) is a method of budgeting whereby all activities are evaluated each time the budget is formulated and every item of expenditure in the budget is fully justified. That is, ZBB involves starting from scratch or zero. In traditional budgeting, departmental managers' need justify only increases over the prior year's budget (known as incremental budgeting). This implies that what is already being spent is automatically sanctioned. Under the ZBB concept, each department's functions are reviewed completely and all expenditures, rather than only the increase,

must be approved. Also, in some departments, ascertainment of budgeted costs is easier than other departments. For example, in production departments, it is easier to determine costs of inputs to achieve a level of budgeted output. But, in other departments such as accounts, personnel, research and development, it is difficult to even identify the output, and therefore equally greater difficult to determine the cost of input to sustain (unidentifiable) output. Consequently, the budgets of the previous year tend to be subjectively increased as the next year's budgeted expenditure. However, the previous year's budgets may be inefficient and merely adjusting next year's budgets to the previous year's budget may result in wastages. ZBB overcomes this problem, to a certain extent. ZBB rejects the traditional view on annual budgeting as an incremental process which takes into account current expenditure plus an estimate of next year's expenditure to arrive at the next budget. Instead, the projected expenditure for existing programmes should start from base zero with each year's budgets being compiled as if the programmes were being launched for the first time.

Application of ZBB

ZBB involves the following stages (steps):

- a. Each separate activity of the organisation is identified and called a decision package. A decision package is a document that identifies and describes a specific activity in such a manner that the management can (i) evaluate it and ranks it against other activities competing for limited resources, and (ii) decide whether to approve or disapprove it.
- b. Each decision package must be justified, *i.e.*, it should be enquired into whether a decision package promotes the goals of an enterprise.
- c. If justified, then the cost of minimum efforts needed to sustain each decision package is determined.
- d. Alternatives for each decision packages are considered in order to select better and cheaper options for the package.
- e. Incremental decision packages are also justified and coasted in the above manner. The incremental packages describe the costs and benefits of additional work that could be done above that required by the base package for the minimum amount of

work needed to carry out the activity.

- f. Managers rank their decisions package in order of priority for resource allocation.
- g. Resources are allocated to the packages.

Advantages of ZBB

- a. It represents a move towards allocation of resources by need and benefit and thus results in more efficient allocation of resources.
- b. It identifies and eliminates wastages and obsolete operations.
- c. It ensures that the best possible methods of performing jobs are used and that new ideas emerge.
- d. It creates a questioning attitude rather than one which accepts that current practices represent value for money.
- e. It leads to increased staff involvement which may lead to improved motivation and greater interest in the job.
- f. It increases communication within the organisation.
- g. Managers become more aware of the costs of inputs which help them to identify priorities.
- h. The documentation of decision packages provides management with a deep, coordinated knowledge of all organization's activities.
- i. It is useful especially for service departments where it can be difficult to identify output.

Disadvantages of ZBB

- a. The costs involved in preparing a vast number of decision packages in a large firm are very high.
- b. It is very time-consuming and a large amount of additional paper work is involved.
- c. Managers develop fear and feel threatened by ZBB and therefore may oppose new ideas and changes.
- d. The ranking of decision packages and allocation of resources is subjective to certain degree, which can result in departmental conflict
- e. Administration and communication of ZBB process may become critical

problems because more managers become involved in this process than in most budgeting and planning procedures and these problems are further compounded in large organizations

7.8 OVERVIEW OF FINANCIAL MANAGEMENT

Suppose you are planning to start your own business. No matter what the nature of your proposed business is and how it is organized, you will have to address the following questions:

- What capital investments should you make? That is, what kinds of real estate, machineries, and R&D programmes should you invest in?
- How will you raise money to pay for the proposed capital investments? That is, what will be the mix of equity and debt in your financing plan?
- How will you handle the day-to-day financial activities like collecting your receivables and paying your suppliers?

While these are not the only concerns of financial management, they are certainly the central ones.

FINANCIAL DECISIONS

As mentioned at the outset, there are three broad areas of financial decision making, viz. capital budgeting, capital structure, and working capital management.

Capital Budgeting

The first and perhaps the most important decision that any firm has to make is to define the business or businesses that it wants to be in. This decision has a significant bearing on how capital is allocated in the firm.

Once the managers of a firm choose the business or businesses they want to be in, they have to develop a plan to invest in buildings, machineries, equipments, research and development, godowns, showrooms, distribution network, information infrastructure, brands, and other long-lived assets. This is the capital budgeting process.

Considerable managerial time, attention, and energy is devoted to identify, evaluate, and implement investment projects. When you look at an investment project from the financial point of view, you should focus on the magnitude, timing, and riskiness of cash flows associated with it. In addition, consider the option embedded in the investment projects.

Capital Structure

Once a firm has decided on the investment projects it wants to undertake, it has to figure out ways and means of financing them. The key issues in capital structure decision are: What is the optimal debt-equity ratio for the firm? Which specific instruments of equity and debt finance should the firm employ? Which capital markets should the firm access? When should the firm raise finances? At what price should the firm offer its securities?

An allied issue is the dividend decision of the firm. What is the optimal dividend payout ratio for the firm? Should the firm buy back its own shares?

Capital structure and dividend decision should be guided by considerations of cost and flexibility, in the main. The objective should be to minimize the cost of financing without impairing the ability of the firm to raise finances required for value creating investment projects.

Working Capital Management

Working capital management, also referred to as short-term financial management, refers to the day-to-day financial activities that deal with current assets (inventories, debtors, short-term holdings of marketable securities, and cash) and current liabilities (short-term debt, trade creditors, accruals, and provisions).

The key issues in working capital management are: What is the optimal level of inventory for the operations of the firm? Should the firm grant credit to its customers and, if so, on what terms? How much cash should the firm carry on hand? Where should the firm invest its temporary cash surpluses? What sources of short-term finance are appropriate for the firm?

7.8.1 GOAL OF FINANCIAL MANAGEMENT

Finance theory rests on the premise that managers should manage their firm's resources with the objective of enhancing the firm's market value.

You may ask why are we overlooking the interests of customers, employees, and suppliers. No company can succeed unless it offers value for money to its customers, provides satisfactory employment conditions to its employees, and treats its suppliers fairly. Hence the question of neglecting the interests of these constituencies to promote the welfare of shareholders simply does not arise. More value for shareholders does not imply less value for customers, employees, or suppliers. On the contrary, only by focusing on creating value for its shareholders can a firm ensure that it has durable and mutually beneficial relationships with their customers, employees, and suppliers.

THE FUNDAMENTAL PRINCIPLE OF FINANCE

The key question that you have to ask before making a business decision is: Will the decision raise the market value of the firm? To answer this question, let us look at the fundamental principle of finance.

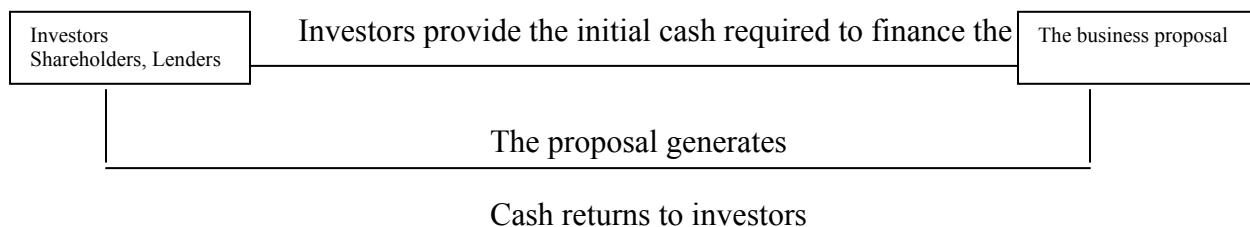
A business proposal- regardless of whether it is a new investment or acquisition of another company or a restructuring initiative-raises the value of the firm only if the present value of the future stream of net cash benefits expected from the proposal is greater than the initial cash outlay required to implement the proposal.

The difference between the present value of future cash benefits and the initial outlay represents the net present value or NPV of the proposal:

Net present value + Present value of future cash benefits – initial cash outlay

Note that the costs and benefits of a business proposal have to be measured in cash. As shown in fig 7.3, investors who finance a proposal invest cash and are hence interested only in cash returns.

Fig 7.3 Cash Alone matters



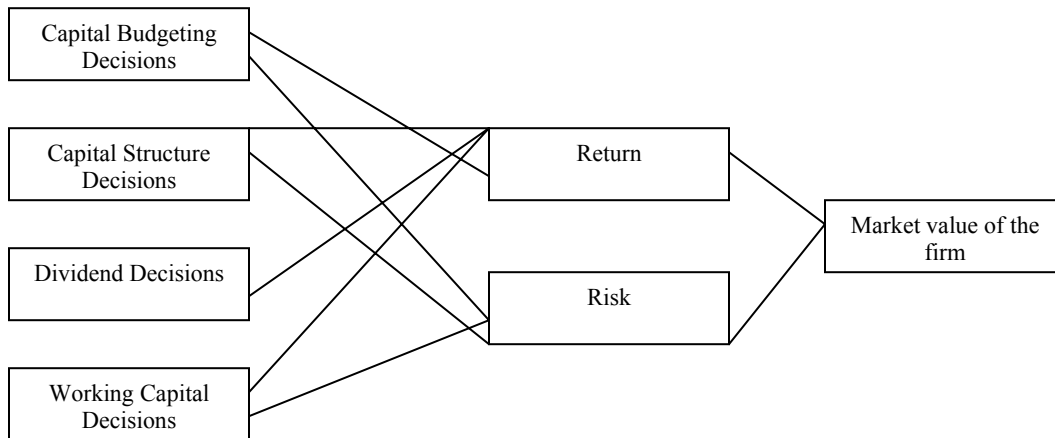
o convert the expected cash returns from the proposal into a present value figure an appropriate discount rate has to be applied. The discount rate reflects the riskiness of the proposal.

RISK-RETURN TRADEOFF

A firm has to choose between alternative courses of action. Should the firm set up a plant which has a capacity of one million tons or two million tons? Should the debt-equity ratio of the firm be 2:1 or 1:1? Should the firm purpose a generous credit policy or niggardly credit policy? Should the firm carry a large inventory or a small inventory?

The alternative courses of action typically have different risk-return implications. A large plant may have a higher expected return and a higher risk exposure, whereas a small plant may have a lower expected return and a lower risk exposure. A higher debt-equity ratio compared to a lower debt-equity ratio may reduce the cost of capital but expose the firm to greater risk. A ‘hot’ stock, compared to a defensive stock, may offer a higher expected return but also a greater possibility of loss.

In general, when you make a financial decision, you have to answer the following questions: what is the expected return? What is the risk exposure? Given the risk-return characteristics of the decision, how would it influence value? Fig 7.4 shows schematically the relationship between the key financial decisions, return, risk, and market value.

Fig 7.4 *Decisions, return, risk, and Market value*

The Time Value of Money

Money has time value. A rupee today is more valuable than a rupee a year hence. Why?

There are several reasons:

- Individuals, in general, prefer current consumption to future consumption.
- Capital can be employed productively to generate positive returns. An investment of one rupee today would grow to $(1 + r)$ a year hence (r is the rate of return earned on the investment)
- In an inflationary period, a rupee today represents a greater real purchasing power than a rupee a year hence.

Many financial problems involve cash flows occurring at different points of time. For evaluating such cash flows, an explicit consideration of time value of money is required.

FUTURE VALUE

Suppose you have Rs.1,000 today and you deposit it with a financial institution which pays 1- per cent interest compounded annually, for a period of 3 years. The deposit would grow as follows.

First year:	Principal at the beginning Interest for the year (Rs.1,000x 0.10) Principal at the end	1,000 100 1100
Second year:	Principal at the beginning Interest for the year (Rs.1,100x 0.10) Principal at the end	1,100 110 1,210
Third year:	Principal at the beginning interest for the year (Rs.1,000x 0.10) Principal at the end	1,210 121 1,331

Formula

The general formula for the future value of a single amount is:

$$\text{Future Value} = \text{present Value} (1 + r)^n$$

Where r is the interest rate per year and n is the number of years over which compounding is done. The factor $(1 + r)^n$ is called the future value factor, FV_m . It is very tedious to calculate this factor unless you have a calculator. To reduce the tedium, tables are available. Table 7.23 gives the value of this factor for several combinations of r and n . A comprehensive table is given in Appendix A at the end of this book.

Table 7.23 Value of FV_m for various combinations of r and n

n/r	6%	8%	10%	12%	14%
2	1.124	1.166	1.210	1.254	1.300
4	1.262	1.361	1.464	1.574	1.689
6	1.419	1.587	1.772	1.974	2.195
8	1.594	1.851	2.144	2.476	2.853
10	1.791	2.518	2.594	3.106	3.707

Example If you deposit Rs.1000 today in a bank which pays 10 per cent interest, compounded annually, how much will the deposit grow to after 8 years and 12 years?

The future value, 8 years hence will be Rs.1,000 $(1.10)^8 = \text{Rs.}1000 (2.144)$

$$= \text{Rs } 2144$$

The future value, 12 years hence will be $\text{Rs } 1000 (1.10)^{12} = \text{Rs.}1000 (3138)$

$$= \text{Rs.}3138$$

Doubling Period

Investors commonly ask the question; how long would it take to double the amount at a given rate of interest? To answer this question, we may look at the future value factor table. Looking at exhibit 10.1, we find that when the interest rate is 12 per cent, it takes about 6 years to double the amount,; when the interest rate is 6 per cent, it takes about 12 years to double the amount, so on and so forth. Is there a thumb rule which dispenses with the use of the future value interest factor table? Yes, there is one and it is called the Rule of 72. According to this thumb rule, the doubling period is obtained by dividing 72 by the interest rate. For example, if the interest rate is 8 per cent, the doubling period is about 9 years ($72/8$). Likewise, if the interest rate is 4 per cent, the doubling period is about 18 years ($72/4$). Though somewhat crude, it is a handy and useful thumb rule.

Shorter Compounding Periods

So far we have assumed that compounding is done annually. Now, consider the case where compounding is done more frequently. Suppose you deposit Rs.1000 with a finance company, which advertises that it pay 12 per cent interest semi-annually- this means that the interest is paid every six months. Your deposit (if interest is not withdrawn) grows as follows:

First Six Months:	Principal at the beginning	Rs.1000.0
	Interest for the 6 months (Rs.1,000x 12/2)	Rs. 60.0
	Principal at the end	Rs 1,060.0
Second Six Months:	Principal at the beginning	Rs.1060.0
	Interest for the 6 months (Rs.1,060x 12/2)	Rs. 63.6
	Principal at the end	Rs. 1,123.6

Note that if the compounding is done annually, the principal at the end of one year would be Rs.1000 (1.12) = Rs.1120.0. The difference of Rs.3.6 (between Rs.1123.6 under semi-annual compounding interest for the second 6 months.

The general formula for the future value of a single cash amount when compounding is done more frequently than annually is:

$$\text{Future Value} = \text{present Value} (1 + r/m)^{m \times n}$$

Where r is the nominal annual interest rate, m is the number of times compounding is done in a year, and n is the number of years over which compounding is done.

Example; How much does a deposit of Rs.5000 grow to at the end of 6 years, if the nominal rate of interest is 12 per cent and the frequency of compounding is 4 times a year? The amount after 6 years will be $\text{Rs.5000} (1 + 0.12/4)^{4 \times 6} = \text{Rs.5000} (1.03)^{24} = \text{Rs.5000} \times 2.0328 = \text{Rs.10,164}$.

Effective versus nominal Rate

We have seen above that Rs.1000 grows to Rs.1123.6 at the end of the year if the nominal rate of interest is 12 per cent and compounding is done semi-annually. This means that Rs.1000 grows at the rate 12.36 per cent per annum. The figure of 12.36 per cent is called the **effective rate of interest** – the rate of interest under annual compounding, which produces the same results as that produced by an interest rate of 12 per cent under semi-annual compounding.

The general relationship between the effective rate of interest and the nominal rate of interest is as follows:

$$R = (1 + k/m)^m - 1$$

Where r is the effective rate of interest, k is the nominal rate of interest, and m is the frequency of compounding per year.

Example a bank offers 8 per cent nominal rate of interest with quarterly compounding. What is the effective rate of interest? The effective rate of interest is: $(1 + 0.08/4)^4 - 1 = 0.0824 = 8.24$ per cent.

Table 7.24 gives the relationship between the nominal and effective rates of interest for different compounding periods. In general, the effect of increasing the frequency of compounding is not as dramatic as some would believe it to be – the additional gains dwindle as the frequency of compounding increases.

Table 7.24 Nominal and Effective Rates of Interest

Nominal rate %	Effective Rate %			
	Annual Compounding	Semi-annual Compounding	Quarterly Compounding	Monthly Compounding
8	8.00	8.16	8.24	8.30
12	12.00	12.36	12.55	12.68

FUTURE VALUE OF ANNUITY

An annuity is a series of periodic cash flows (payments and receipts) of equal amounts. The premium payments of a life insurance policy, for example, are an annuity. When the cash flows occur at the end of each period, the annuity is called a regular annuity or a deferred annuity. When the cash flows occur at the beginning of each period, the annuity is called an annuity due. Our discussion here will focus on a regular annuity – the formulae of course can be applied, with some modifications, to an annuity due.

Suppose you deposit Rs.1000 annually in a bank for 5 years and your deposits earn a compound interest rate of 10 per cent. What will be the value of this series of deposits (an annuity) at the end of 5 years? Assuming that each deposit occurs at the end of the year, the future value of this annuity will be:

$$\begin{aligned}
 &= \text{Rs.}1000 (1.10)^4 + \text{Rs.}1000 (1.10)^3 + \text{Rs.}1000 (1.10)^2 + \text{Rs.}1000 (1.10) + \text{Rs.}1000 \\
 &= \text{Rs.}1000 (1.464) + \text{Rs.}1000 (1.331) + \text{Rs.}1000 (1.21) + \text{Rs.}1000 (1.10) + \text{Rs.}1000 \\
 &= \text{Rs.}6105.
 \end{aligned}$$

The time line of this annuity is shown in Table 7.25

Table 7.25 Time Line for an Annuity

1	2	3	4	5
1000	1000	1000	1000	1000 (+)
				1100 (+)
				1210 (+)
				1331 (+)
				1464 (+)
				Rs.6106

Formula

In general terms, the future value of an annuity is given by the formula:

$$\text{Future value of an annuity} = \text{constant periodic flow} \frac{(1+r)^n - 1}{r}$$

where r is the interest rate per period and n , the duration of the annuity. The expression in the bracket is the future value annuity factor, $FVA_{r,n}$. Table 7.26 shows the value of this factor for several combinations of r and n . A comprehensive table is given in appendix at the end of this book.

Table 7.26 Value of $FVA_{r,n}$ for various combinations of r and n

N/r	6%	8%	10%	12%	14%
2	2.060	2.080	2.100	2.120	2.140
4	4.375	4.507	4.641	4.779	4.921
6	6.975	7.336	7.716	8.115	8.536
8	9.897	10.636	11.436	12.299	12.232
10	13.181	14.487	15.937	17.548	19.337
12	16.869	18.977	21.384	24.133	27.270

Example four equal annual payments of Rs.2000 are made into a deposit account that pays 8 percent interest year. What is the future value of this annuity at the end of 4 years?
 $Rs.2000 (FVA_{8\%, 4yrs}) = Rs 2000 (4.507) = Rs.9014.$

PRESENT VALUE

Suppose someone promised to give you Rs 1000 three years hence. What is the present value of this amount if the interest rate is 10 per cent? The present value can be calculated by discounting Rs.1000 to the present point of time as follows:

Value three years hence	=	Rs.1000
Value two years hence	=	Rs.1000 (1/1,10)
Value one year hence	=	Rs.1000 (1/1.10) x (1/1.10)
Value now (present value)	=	Rs.1000 (1/1.10) x (1/1.10) x (1/1.10)

Formula

The process of discounting, used for calculating the present value, is simply the inverse of compounding. The present value formula can be readily obtained by manipulating the compounding formula.

$$\text{Future Value} = \text{Present Value} (1+r)^n$$

Dividing both the sides of the above equation by $(1+r)^n$ we get,

$$\text{Present value} = \text{Future value} * 1/((1 + r)^n)$$

The factor $1/ (1+r)^n$, in the above equation is called the present value factor, $PV_{r,n}$. Table 7.27 gives the value of this factor for several combinations of r and n . A comprehensive table is given in appendix A. at the end of the book.

Example: Find the present value of Rs.1000 receivable 6 years hence, if the rate of discount is 10 per cent.

The present value is: Rs.1000 (PV 10%, 6) = Rs.1000 (0.564) = Rs.564

Table 7.27 Value of PV r, n for various combination of r and n

n/r	6%	8%	10%	12%	14%
2	0.890	0.857	0.826	0.797	0.770
4	0.792	0.735	0.683	0.636	0.592
6	0.705	0.630	0.564	0.507	0.456
8	0.626	0.540	0.467	0.404	0.351
10	0.558	0.463	0.386	0.322	0.270
12	0.497	0.397	0.319	0.257	0.208

PRESENT VALUE OF ANNUITY

Suppose you expect to receive Rs.1000 annually for 3 years, each receipt occurring at the end of the year. What is the present value of this stream of benefits if the discount rate is 10 per cent? The present value of this annuity is simply the sum of the present values of all the inflows of this annuity.

$$\text{Rs.1000} (1/1.10) + \text{Rs.1000} (1/1.10)^2 + \text{Rs.1000} (1/1.10)^3$$

$$\text{Rs.1000} \times 0.909 + \text{Rs.1000} \times 0.826 + \text{Rs.1000} \times 0.751 = \text{Rs.2486.}$$

Table 7.28 *Time Line of an Annuity*

0	1	2	3
	1000	1000	1000
909			
826			
751			
Rs.2456 present value			

Formula

In general term, the present value of an annuity is given by the formula.

$$\text{Present value of an annuity} = \text{Constant periodic flow} * 1 - \frac{1}{\frac{(1+r)^n}{r}}$$

where r is the interest rate per periodic and n, the duration of the annuity. The expression in the bracket is the present value annuity factor $PVA_{r,n}$.

Table 7.29 shows the value of this factor for several combinations of r and n. A more comprehensive table is given in Appendix A, at the end of this book.

Table 7.29 *Value of $PVA_{r,n}$ for various combinations of r and n*

N/r	6%	8%	10%	12%	14%
2	1.833	1.783	1.737	1.690	1.647
4	3.465	2.312	3.170	3.037	2.914
6	4.917	4.623	4.355	4.111	3.889
8	6.210	5.747	5.335	4.968	4.639
10	7.360	6.747	6.145	5.650	5.216
12	8.384	7.536	6.814	6.194	5.660

Example What is the present value of a 4 year annuity of Rs.10000 discounted at 10 per cent?

The $PVA_{10\%, 4}$ is 3.170.

Hence, the present value of the annuity is Rs.10,000 (3.170) = Rs.31,700

Loan Amortisation Schedule

Most loans are repaid in equal periodic instalments (monthly, quarterly, or annually), which cover interest as well as principal repayment. Such loans are referred to as amortised loans.

For an amortised loan we would like to know (a) the periodic installment payment' and (b) the loan amortisation schedule showing the break-up of the periodic installment payments between the interest component and the principal repayment component. To illustrate how these are calculated, let us look at an example.

Suppose a firm borrows Rs.1,000,000 at an interest rate of 15 per cent and the loan is to be repaid in 5 equal installments payable at the end of each of the next 5 years. The annual installment payment A is obtained by solving the following equation.

$$\text{Loan amount} = a \times PVAn =_{5, r=15\%}$$

$$1,000,000 = A \times 3.3522$$

$$\text{Hence } A = 298,312$$

The amortisation schedule is shown in Table 7.30. The interest component is the largest for year 1 and progressively declines as the outstanding loan amount decreases.

Table 7.30 Loan Amortisation Schedule

Year	Beginning Amount (1)	Annual Instalment (2)	Interest (3)	Principal repayment (2)-(3) = (4)	Remaining Balance (1)-(4) =(5)
1	1,000,000	298,312	150,000	148,312	851,688
2	851,688	298,312	127,753	170,559	681,129
3	681,129	298,312	102,169	196,143	484,986
4	484,986	298,312	72,748	225,564	259,422
5	259,422	298,312	38,913	259,399	23

- Interest is calculated by multiplying the beginning loan balance by the interest rate.
- Principal repayment is equal to annual instalment minus interest.
- Due to rounding off error a small balance is shown.

Equated Monthly Installment

In the previous illustration we considered equated annual instalments. In many cases, such as housing loans or car loans, however, the borrower has to repay the loan with interest in equated monthly installments (EMIs). The calculation of the EMI is analogous to calculation of the equated annual installment, except that the unit period is one month not one year. The calculation of EMI may be illustrated with an example. Shyam takes a housing loan is to be repaid over 180 months What is the EMI? The EMI is obtained by solving the following equation:

$$1,000,000 = A \times PVA_{n=180, r=1.00\%}$$

$$1,000,000 = A \times \frac{1 - \frac{1}{(1+r)^n}}{r}$$

$$1,000,000 = A \times \frac{1 - \frac{1}{(0.01)^{180}}}{.01}$$

$$1,000,000 = A \times 83.3217$$

$$A = \frac{1,000,000}{83.3217} = 12,002$$

Present Value of a Perpetuity

A perpetuity is an annuity of infinite duration. In general terms:

Present value of a perpetuity = constant periodic flow/ r

where r is the discount rate. The expression in the bracket is the present value perpetuity factor. Put in words, it means that the present value perpetuity factor is simply 1 divided by the interest rate expressed in decimal form. Hence, the present value of a perpetuity is simply equal to the constant annual payment divided by the interest rate. For example, the present value of a perpetuity of Rs.10,000 if the interest rate is 10 per cent is equal to Rs.10000/0.10 = Rs.100,000. Intuitively, this is quite convincing because an initial sum of Rs.100,000 would, if invested at the interest rate of 10 per cent, provide a constant annual income of Rs.10,000 forever, without any impairment of the capital value.

14.0 Capital Budgeting

Capital budgeting is a complex process, which may be divided into the following phases:

- Identification of potential investment opportunities
- Assembling of proposals investment
- Decision making
- Preparation of capital budget and appropriations
- Implementation
- Performance review

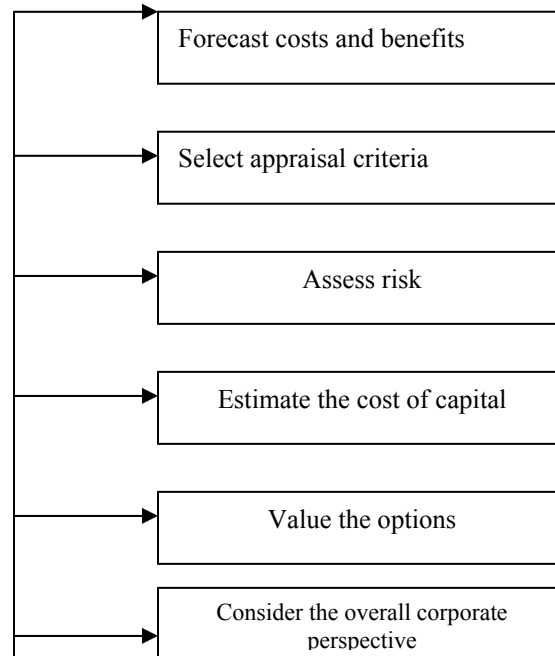
7.9 PROJECT APPRAISAL

Project appraisal involves six broad steps as shown in Fig 7.5. A brief description of these steps are as follows:

1. **Forecast the costs and benefits** A capital project involves costs and benefits extending over a period of time. Typically, costs are incurred in the form of initial cash outlays on fixed assets and net current assets. Benefits are derived in the form of cash inflows from the operations of the project over its economic life, plus terminal cash inflow from the liquidation of the project at the end of its economic life.
2. **Apply suitable investment criteria** The stream of costs and benefits of the project has to be converted into a measure indicating how worthwhile is the project. For this purpose, several investment criteria are used. They fall into two broad categories: discounted cash flow, criteria and non-discounted cash flow criteria. While the former calls for discounting the future benefits using an appropriate discount rate, the latter does not involve any discounting.
3. **Assess the riskiness of the project** Costs and benefits associated with a capital project are almost invariably subject to risk. There may be a lot of variability characterizing factors like project cost, sales quantity, selling price, material cost, energy cost, project life, and salvage value. The actual values of these variables often turn out to be different from their forecast values. Hence, you should try to get a

handle over how the variability in these factors try to get a handle over how the variability in these factors can affect the attractiveness of the project.

Fig 7.5 Key Steps in Project Appraisal



4. **Estimate the cost of capital** The cost of capital is the discount rate used for evaluating a capital project. Under appropriate conditions, it is measured as the weighted average cost of different sources of capital employed for financing the project. The cost of a specific source of finance is defined as the rate of discount that equates the present value of the expected post-tax payments to that source of finance, with the net funds received from that source.
5. **Value the options** The traditional approach to project appraisal calls for judging a project on the basis of its net present value, obtained by discounting the project cash flow stream using an appropriate cost of capital. This approach, however, is incomplete, as it fails to capture the value of real options embedded in the project. Hence, the traditional NPV analysis needs to be expanded to include the value of real options inherent in the project.

6. Consider the overall corporate perspective

Capital investments in plant, machinery, buildings, research facilities, product development, marketing programmes, and so on are tangible expressions of a company's strategy. Hence, capital investment decision must be evaluated from the overall perspective of the firm. In such an evaluation, due consideration should be given to general economic outlook, prospects of industries in which the firm operates, and the competitive position and core competencies of the firm.

The following sections dwell at length on the issues involved in various steps of project appraisal.

7.10 COSTS AND BENEFITS

Capital expenditures typically involve current and near future costs that are expected to generate benefits in the future.

Basic Principles

While measuring the costs and benefits of a capital expenditures proposal, you must bear in mind the following guidelines:

Focus on Cash Flows: costs and benefits must be measured in terms of cash flows-costs are cash outflows and benefits are cash inflows. Cash flows matter because they represent the purchasing power.

Since accounting figures are based on the accrual principle, they have to be adjusted to derive the cash flows. For example, depreciation and other non-cash charges, which are deducted in computing profits from the accounting point of view, have to be added back as they do not entail cash outflows.

Estimate cash flows on a post-tax basis. Some firms look at pretax cash flows and, to compensate that, apply a discount rate greater than the cost of capital. However there is no reliable basis for making such adjustments. Hence, as a rule, work with post tax cash flows.

Measures Cash flows on an Incremental Basis: The value of a project depends on its incremental cash flows which are defined as the difference between “Cash flows of the Firm with the project” and “Cash flows of the firm without the project.”

In estimating the incremental cash flows of a project, bear in mind the following sub-guidelines:

Consider all Incidental effects: In addition to its direct cash flows, a project may have incidental effects on the rest of the firm. It may enhance the profitability of some of existing activities of the firm as it has a complementary relationship with them; or it may detract from the profitability of some of the existing activities as it has a competitive relationship with them- all these must be taken into account.

Ignore sunk Costs: Sunk costs represents past outlays that can not be recovered and, hence, are not relevant for new investment decisions. Remember that ‘bygones are bygones’.

Include Opportunity Costs: If a project requires the use of some resources already available with the firm, the opportunity cost of these resources should be charged to the project. The opportunity cost of a resource is the value of net cash flows that can be derived from it if it were put to its best alternative use. Suppose a project requires a vacant piece of land within the factory premises of the firm. The cost of this land represents a sunk cost and, hence, is not relevant for the new project. But the project should be charged with the opportunity cost of this land which represents the benefit that can be derived by putting it to its best alternative use, which in this case may simply be leasing the land to another firm.

Question the allocation of Overhead Costs: Accountants normally allocate organizational overhead costs to various divisions or projects on some basis. Hence, when a project is proposed, apportion of the organizational overhead costs is allocated to it. This may, however, have no relationship with the incremental organizational overhead cost associated with. Remember that what matters is the incremental overhead costs

(along with other incremental costs), attributable to the project and not the allocated overhead costs.

Do not forget Net Working Capital: Apart from investment in fixed assets like land, building, machinery, and technical know how, a project also requires investment in current assets like cash, receivable (debtors), and inventories. A portion of current assets is supported by non-interest bearing current liabilities like accounts payable (creditors) and provisions. The difference between current assets and non-interest bearing current liabilities is the net working capital. It is financed by equity, preference, and debt. While estimating the investment outlay of a project, do not forget the investment in net working capital.

Exclude Financing Costs When you define project cash flows, exclude financing costs like interest on debt and dividend on preference and equity. Why? The weighted average cost of capital used for discounting the project cash flows reflects the cost of debt, preference and equity capital. Hence, if interest on debt and dividend on preference and equity are deducted in estimating project cash flows, cost of capital will be counted twice. Guard against this error.

Treat Inflation Consistently Interest rates are usually expressed in nominal terms, not real terms. For example, if IDBI issues a debenture carrying an interest rate of say, 10 per cent, the 10 percent rate is a nominal rate. This means that, if you buy a Rs.100 debenture you will get a nominal return of 10 per cent. If the inflation rate happens to be, say 5 per cent, your real return will be correspondingly less. To figure out your real return, use the following formula:

$$(1 + \text{Real return}) = \frac{(1 + \text{Nominal return})}{(1 + \text{Inflation rate})}$$

applying this to the IDBI debenture, you get

$$(1 + \text{Real return}) = \frac{(1 + 0.10)}{(1 + 0.05)} = 1.048$$

Hence, the real return is 4.8 per cent.

Since discount rates are usually quoted in nominal terms, you should, for reasons of consistency, estimate the project cash flows too in nominal terms. This means that, you must consider the trends in prices and costs in nominal terms.

You can, of course, work with real cash flows (cash flows that abstract away the impact of inflation). If you do so, make sure that the discount rate too is stated in real terms.

Components of the Cash flow Stream

The cash flow stream of a project may be divided into three parts as follows:

- **Initial flows** These represent the cash outflows associated with investment in various project components. Initial flows are defined as:

Outlays on plant, machinery, and other fixed assets.

-

Tax shields relating to investment in plant, machinery, and other fixed asset

+

Outlays on net working capital

- **Operational flows** These are cash inflows expected during the operational phase of the project. The operational cash inflow for a given year is equal to: Profit after tax + Depreciation and other non cash charges.

- **Terminal flows** Cash flows expected from the disposal of assets when the project is terminated are referred to as terminal flows. Terminal flows are defined as:

Post tax salvage value of fixed assets + Post tax salvage value of net working capital.

Illustration

Naveen Enterprises is considering a capital project about which the following information is available:

- The investment outlay on the project will be Rs.100 million. This consists of Rs.80 million on plant and machinery and Rs.20 million on net working capital. The entire outlay will be incurred at the beginning of the project.
- The project will be financed with Rs.45 million of equity capital, Rs.5 million of preference capital, and Rs.50 million of debt capital. Preference capital will

carry a dividend rate of 15 percent; debt capital will carry an interest rate of 15 percent.

- The life of the project is expected to be 5 years. At the end of 5 years, fixed assets will fetch a net salvage value of Rs.30 million whereas net working capital will be liquidated at its book value.
- The project is expected to increase the revenues of the firm by Rs.120 million per year. The increase in costs on account of the project is expected to be Rs.80 million per year (This includes all items of cost other than depreciation, interest, and tax). The effective tax rate will be 30 per cent.
- Plant and machinery will be depreciated at the rate of 25 per cent per year as per the written down value method. Hence, the depreciation charges will be:

First Year : Rs.20.00 million

Second Year: Rs.15.00 million

Third Year: Rs.11.25 million

Fourth Year: Rs.8.44 million

Fifth Year : Rs.6.33 million

Given the above details, the project cash flows are shown in Table 7.31.

Table 7.31 Project Cash Flows

(Rs.in million)

		0	1	2	3	4	5
A	Fixed assets	(80.00)					
B	Net working capital	(20.00)					
C	Revenues		120	120	120	120	120
D	Costs (other than depreciation and interest)		80	80	80	80	80
E	Depreciation		20	15	11.25	8.44	6.33
F	Profit after tax		14.0	17.5	20.12	22.09	23.57
G	Tax		6	7.5	8.63	9.47	10.10
H	Profit after tax		14.0	17.5	20.12	22.09	23.57
I	Net salvage value of fixed assets						30.00
J	Recovery of net working capital						20.00
K	Initial outlay	(100.00)					
L	Operating cash flow (H+E)		34.0	32.5	31.37	30.53	29.90
M	Terminal cash flow (I+J)						50.0
N	Net cash flow (K+L+M)	(100.00)	34.0	32.5	31.37	30.53	79.90
	Book value of investment	100	80	65	53.75	45.31	

7.11 INVESTMENT CRITERIA

Once the stream of costs and benefits has been defined, it must be evaluated to determine whether the project is worthwhile or not. Several criteria have been proposed for such evaluation, of which, the important ones are:

- Payback period
- Average rate of return
- Net present value
- Internal rate of return.

Payback Period

The payback period is the length of the time required to recover the initial cash outlay on the project. For example, a project involves a Cash outlay of Rs.600,000 and generates cash inflows of Rs.100,000, Rs.250,000, Rs.250,000, and Rs.2000,000 in the first, second, third and fourth years, respectively. In this case, the payback period is 3 years because the sum of cash inflows during 3 years is equal to the initial outlay. When the annual cash inflow is a constant sum, the payback period is simply the initial outlay divided by the annual cash inflow. For example, a project which has an initial cash outlay of Rs.1,000,000 and a constant annual cash inflow of Rs.300,000 has a payback period of $\text{Rs.1,000,000} / \text{Rs.300,000} = 3\frac{1}{3}$ years.

To figure out the payback period of Naveen Enterprise's capital project, let us look at the cumulative cash flow, till it turns positive:

Year	Cash flow	Cumulative cash flow
0	-100.00	-100.00
1	34.00	-66.00
2	32.50	-33.50
3	31.37	-2.13
4	30.53	+28.40

Since the cumulative cash inflow is negative at the end of year 3 but positive at the end of year 4, the payback period is between 3 and 4 years.

According to the payback period criterion, the shorter the payback period, the more desirable the project. Firms using this criterion generally specify the maximum acceptable payback period. If this is n years, only projects with a payback period of n years or less are deemed worthwhile.

Evaluation A widely used investment criterion, the payback period, seems to offer the following advantages:

- It is simply, both in concept and application. It does not use complicated concepts or tedious calculations and has few hidden assumptions.
- It is a rough and ready method for dealing with risk. It favours projects which generate substantial cash inflows in earlier years while discriminating against those which bring substantial cash inflows in later years. Now, if risk tends to increase with futurity- and in general this may be true- the payback criterion can be helpful in weeding out risky projects.
- Since it emphasizes earlier cash inflows, it is a sensible criterion when the firm is pressed with problems of liquidity.

The limitations of payback criterion, however, are very serious:

- It fails to consider the time value of money. In the payback calculation, cash inflows are simply added without suitable discounting. This violates the most basic principle of financial analysis, which stipulates that cash flows occurring at different points of time can be added or subtracted only after suitable compounding or discounting.
- It ignores cash flows beyond the payback period. This leads to discrimination against projects, which generate substantial cash inflows in later years.
- It is a measure of a project's capital recovery, not its profitability.
- Though it measures a project's liquidity, it does not indicate the liquidity position of the firm as a whole, which is more important.

Average Rate of Return

The average rate of return, also called the accounting rate of return, defined as:

$$\text{(Profit after tax/Book value of the investment)}$$

The numerator of this ratio is the average annual post-tax profit over the life of the investment; the denominator is the average book value of investment committed to the

project. To illustrate the calculation of average rate of return, consider the data for the project of Naveen Enterprises.

(Rs.in million)

Year	Book value of investment	Profit after tax
1	100.00	14.00
2	80.00	17.5
3	65.00	20.12
4	53.75	22.09
5	45.31	23.57

The average rate of return is:

$$\frac{1/5 (14.0 + 17.5 + 20.12 + 22.09 + 23.57)}{1/5 (100 + 80 + 65 + 53.75 + 45.31)} = 28.31 \text{ per cent.}$$

Evaluation Traditionally, a popular investment appraisal criterion, the average rate of return has the following virtues:

- It is simple to calculate.
- It is based on accounting information, which is readily available and familiar to businessmen.
- It considers benefits over the entire life of the project.
- Its shortcomings, however, seem to be considerable.
- It is based on accounting profit, not cash flow.
- It does not take into account the time value of money.

Net present Value

The net present value of a project is the sum of the present value of all the cash flows associated with it. The cash flows are discounted at an appropriate discount rate (cost of capital). The net present value of Naveen Enterprise's project is calculated below, using a discount rate of 15 per cent which is the cost of capital applicable to this project. For details of how the cost of capital is computed, refer to section 14.5.

Year	Cash Flow	Discount factor	Present value
0	-100.00	1.000	-100.00
1	34.00	0.870	29.58
2	32.50	0.756	24.57

3	31.37	0.658	20.64
4	30.53	0.572	17.46
5	79.90	0.497	39.71
			Sum = 31.96

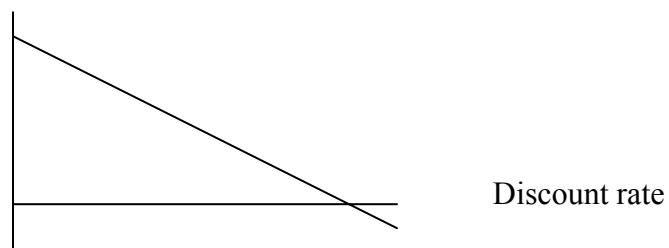
The decision rule associated with the net present value is: accept the project, if the net present value is positive and reject the project, if the net present value is negative. A net present value of zero suggests indifference.

Discount Rate and Net Present Value For projects that have cash outflows followed by cash inflows- most projects are like this- the net present value declines as the discount rate increases. Typically, the relationship between the discount rate and net present value is depicted in Fig 7.6.

Evaluation Conceptually sound, the net present value criterion has considerable merits:

- It takes into account the time value of money.
- It considers the cash flow stream in its entirety.
- It squares neatly with the financial objectives of maximization of the wealth of shareholders. The net present value represents the contribution of the wealth of shareholders.

Fig 7.6 Discount Rate and Net Present Value



While this criterion has hardly any shortcoming, a problem regarding its use may be mentioned. The net present value is an absolute measure and not a relative measure. Decision makers, however, are generally more comfortable with a relative measure (like the accounting rate of return, or the internal rate of return.)

Internal rate of Return

The internal rate of return of a project is the discount rate that makes its net present value equal to zero. It is represented by the point of intersection in exhibit 13.3. Note the key differences between net present value and internal rate of return.

Net Present Value	Internal Rate of return
<ul style="list-style-type: none"> Assumes that the discount rate (cost of capital) is known Calculates the net present value, given the discount rate. 	<ul style="list-style-type: none"> Assumes that the net present value is zero. Figures out the discount rate that makes net present value zero.

To calculate the internal rate of return of a project, you have to try a few discount rates till you find one that makes its net present value zero. In this iterative procedure, bear in mind the following guidelines: If the net present value is positive, raise the discount rate to decrease the net present value; on the other hand, if the net present value is negative, lower the discount rate to increase the net present value. Remember the objective is to drive down the net present value to zero.

To illustrate the calculation of internal rate of return, let us work with the project of Naveen Enterprises and initially try a discount rate of 20 per cent. The net present value at this discount rate works out to Rs.15.88 million, as shown in exhibit 13.4. Since the net present value is positive, we raise the discount rate to 24 per cent in the next iteration. The net present value drops to Rs.5.13 million, as shown in exhibit 13.4. Since it is still positive, we try a higher discount rate, viz 28 per cent. At this discount rate, the net present value becomes Rs.4.02 million as shown in the last column of Table 7.32. Thus, we know that the internal rate of return lies between 24 per cent and 28 per cent. If we resort to linear interpolation in this range the internal rate of return is calculated as follows:

Table 7.32 How the Discount Rate Impacts on the Net Present Value

Year	Cash flow	Discounting rate 20%		Discounting rate 24%		Discounting rate 28%	
		Discount factor	Present value	Discount factor	Present value	Discount factor	Present value
0	-100	1.000	-100.00	1.000	-100.00	1.000	-100.00

1	34.00	0.833	28.3332	0.806	27.40	0.781	26.55
2	32.50	0.694	22.56	0.650	21.13	0.610	19.55
3	31.37	0.579	18.16	0.524	16.44	0.477	14.96
4	39.53	0.482	14.72	0.423	12.91	0.373	11.39
5	79.90	0.402	32.12	0.341	27.25	0.291	23.25
		NPV = 15.88		NPV = 5.13		NPV = 4.02	

-
 Smaller discount rate + $\frac{\text{NPV at the smaller rate}}{\text{Sum of the absolute values of The NPV at the smaller and the Bigger discount rates}}$ x

(Bigger discount rate – smaller discount rate)

$$24\% + \frac{5.13 (28\% - 24\%)}{5.13 + 4.02} = 26.24 \text{ per cent}$$

Evaluation A popular discounted cash flow method, the internal rate of return criterion has several virtues:

- It takes into account the time value of money.
- It considers the cash flow stream in its entirety.
- It makes sense to businessmen who are wonted to think in terms of rate of return and find an absolute quantity such as net present value, somewhat difficult to work with.

The internal rate of return criterion, however, has its own limitations:

- There may be multiple rates of return. If the cash flow stream of a project has more than one change in sign, there is possibility of multiple rates of return.
- The internal rate of return criterion can be misleading when the choice is between mutually exclusive projects that have substantially different outlays. Consider projects P and Q.

	Cash flow		Internal rate of return	Net present value (at 12%)
	0	1		
P	- 10,000	+20,000	100%	7857
Q	- 50,000	+75,000	50%	16,964

Both the projects are good, but Q with its higher net present value contributes more to the wealth of the shareholders. Yet, from an internal rate of return point of view, P looks better than Q. Hence, the internal rate of return criterion seems unsuitable for ranking projects of different scales.

COST OF CAPITAL

The cost of capital of any investment (project, business, or company) is the rate of return the supplier of capital would expect to receive if the capital were invested elsewhere in an investment (project, business or company) of comparable risk. Before discussing the technical details of how the cost of capital is computed, let us reiterate two points.

- The cost of capital reflects expected returns, not historical returns.
- The cost of capital represents an opportunity cost. It reflects the returns investors expect from investments of similar risk.

To illustrate the calculation of the marginal cost of capital, let us look at the financing plan for the project of Naveen Enterprises.

Equity capital (2 million equity shares are proposed to be issued to fetch a net price of Rs.22.5. while the issue price will be Rs.25 per share, the issue expenses will be 10 per cent. The expected dividend per share for the following year is Rs.1.8)	Rs.45 million
Preference capital (50,000 preference shares of Rs.100 each are proposed to be issued to an institutional investor at par. The preference shares will carry a dividend of 15 per cent)	Rs.5 million
Debt capital (0.5 million non-convertible debentures of Rs.100 each will be privately placed with a mutual fund. The debentures will carry an interest rate of 15 per cent)	Rs.50 million

For our present discussion we assume that the risk of the project of Naveen Enterprises is comparable to the risk of the firm as a whole; further, the financing pattern of the project is comparable to the financing pattern of the firm as a whole.

Cost of Debt

The cost of debt is the return required by the creditors of the firm on new borrowings. You can observe the cost of debt, directly or indirectly. Since it is the interest rate the firm must pay on its new borrowings, you can estimate it by looking at the interest rates prevailing in the financial markets. For example, if the firm has outstanding bonds, you can use the yield to maturity on these bonds as a proxy for the cost of new borrowings. Alternatively, if you know that the new bonds of the firm would have a rating of say, AAA, you can look at the interest rate on recently issued AAA bonds. While figuring out the cost of debt, remember that the coupon rate on the firm's outstanding debt is irrelevant. It merely represents a historical cost, not the current cost of debt. What matters is the cost of debt today and this is reflected in the yield prevailing in today's market. The return required by the suppliers of debt capital to Naveen enterprises is 15 per cent. Hence, this represents the pre-tax cost of debt. Since the interest paid on debt capital is a tax deductible expense, the post tax cost of debt is equal to:

Pre-tax cost of debt (1-tax rate) = 15% (1-.3) = 10.5%.

Cost of preference

Since preference capital carries a fixed rate of dividend, the cost of preference capital can be determined fairly easily. It is the dividend rate the firm must pay on a new issue of preference capital. Alternatively, it can be estimated by looking at the yields on outstanding preference shares that are similarly rated. The cost of preference capital for Naveen Enterprises is 15 per cent. Note that the preference dividend, unlike the interest on debt, is not a tax deductible payment. Hence, there is no tax adjustment here.

Cost of Equity

Theoretically, the cost of equity is the return expected by capital providers from investments of similar risk. So you can argue that the cost of equity can be found out by asking equity investors how much return they expect. This is not feasible because the number of equity shareholders for most companies is fairly large, sometimes running into

hundreds of thousands. Further, even if you could ask them, they may not be able to define their expectation the way seasoned bankers or investors do. Many of them may simply say “ I want a high return”. This is not helpful in arriving at a concrete estimate of the cost of equity. Given the practical difficulties in directly ascertaining the return expected by equity shareholders, financial analysts try to deduce investor expectation by indirect ways. Three methods are commonly employed in practice.

- CAPM approach
- Bond yield plus risk premium approach
- Dividend discount model approach.

CAPM Approach according to the capital asset pricing model (which was introduced in chapter 11), risk and return are related as follows:

$$E(R) = R_f + \beta[E(R_M) - R_f]$$

In words, Expected return = risk-free rate + β (Expected return on a risky asset - risk-free rate)

Beta of the asset on market portfolio = $\frac{\text{Expected return on risky asset} - \text{Risk-free rate}}{\text{Expected return on market portfolio} - \text{Risk-free rate}}$

To illustrate the CAPM approach, let us assume that $R_f = 10$ per cent and $E(R_M) = 18$ per cent. The expected return on equity stocks of companies with different betas is given below.

Beta	Expected return = $R_f + \beta[E(R_M) - R_f]$
0.5	$10 + 0.5(18 - 10) = 14\%$
1.0	$10 + 1.0(18 - 10) = 18\%$
1.5	$10 + 1.5(18 - 10) = 22\%$

To apply the CAPM approach, the following inputs are required: R_f , the risk-free rate; $[E(R_M) - R_f]$, the market risk premium, and β the beta of the stock.

While there is a disagreement among finance practitioners as to how these inputs have to be estimated, for our purposes the following will suffice:

- The risk-free rate may be estimated as the yield on a long-term government bond that has a maturity of 10 years or more.
- The market risk premium may be estimated as the difference between the average return on the market portfolio and the average risk-free rate over the past 10 to 30 years- the longer the period, the better it is.
- The beta of the stock may be calculated by regressing the monthly returns on the stock over the monthly returns on the market index over the past 60 months or more.

The CAPM is regarded by many as a fairly rigorous and objective approach to determine the required return on equity. This approach, however, is based on the assumption that investors eliminate unsystematic risk by efficient diversification and hence require compensation only for systematic risk which is reflected in beta. Market imperfections may impede efficient diversification by investors, exposing them to unsystematic risk. When this occurs, investors will require compensation for unsystematic risk, a factor which is not found in the standard CAPM relationship. Another shortcoming of the CAPM relates to the instability of the betas of individual securities. Studies have shown that individual securities have unstable betas. This makes the use of a historical beta as a proxy for the future beta somewhat questionable. Notwithstanding, these shortcomings, the CAPM approach is a useful approach for estimating the required rate of return of equity stocks.

Bond Yield Plus risk Premium Approach Analysts who do not have faith in the CAPM approach often resort to a subjective procedure to estimate the cost of equity. They add a judgmental risk premium to the observed yield on the long-term bonds of the firm to get the cost of equity:

Cost of equity = Yield on long-term bonds + Risk premium.

The logic of this approach is fairly simple. Firms that have risky and consequently high cost debt will also have risky and consequently high cost equity. So it makes sense to base the cost of equity on a readily observable cost of debt.

The problem with this approach is how to determine the risk premium. Should it be 2 per cent, 4 per cent, or n per cent? There seems to be no objective way of determining it. Most analysts look at the operating and financial risks of the business and arrive at a subjectively determined risk premium that normally ranges between 2 per cent and 6 per cent. While this approach may not produce a precise cost of equity, it will give a reasonable ballpark estimate.

Dividend discount Model Approach In chapter 10 we learnt that the price of an equity share is equal to the present value of the dividends expected from it. If we assume that the dividend per share grows at a constant rate g , the price of the equity share is:

$$P_0 = \frac{D_1}{r-g}$$

where P_0 is price, D_1 is the dividend expected a year from now, r is the return expected by shareholders, and g is the growth rate in dividends. Solving the above equation for r , we get.

$$r = \frac{D_1}{P_0} + g$$

Thus, the expected return of shareholders, which in equilibrium is also the required return, is equal to the dividend yield plus the expected growth rate. For a publicly traded company, it is fairly easy to determine the dividend yield. However, estimating the expected growth rate, g , is difficult. You can estimate g by using the following methods.

1. You can get a handle over g by relying on analysts forecasts for the future growth rates. Analysts' forecasts may be available from a variety of sources. Since different sources are likely to give different estimates, a simple approach may be to obtain multiple estimates and then average them.
2. you can look at dividends for the preceding 5-10 years, calculate the annual growth rates, and average them. Suppose you observe the following dividends for some stock.

Year	Dividend Rupee change	Growth	1
1	Rs.3.00	-----	-----
2	Rs.3.50	Rs.0.50	16.7
3	Rs.4.00	Rs.0.50	14.3
4	Rs.4.25	Rs.0.25	6.3
5	Rs.4.75	Rs.0.50	11.8

If you average the four growth rates, the result is 12.3 per cent, so you can use this as an estimate of the expected growth rate.

3. You can use the retention growth rate method. Here, you first forecast the firm's average retention rate (this is simply 1 minus the dividend payout rate) and then multiply it by the firm's expected future return on equity (ROE).

$$g = (\text{Retention rate}) (\text{Return on equity})$$

For example, if the forecasted retention rate and return on equity are 0.60 and 15 per cent, the expected growth rate is:

$$g = (0.6) (15\%) = 9 \text{ per cent.}$$

The dividend growth model is simple. It is easy to understand and easy to apply. However, there are some problems associated with it.

- First, it cannot be applied to companies that do not pay dividend or to companies that are not listed on the stock market. Even for companies that pay dividends, the assumption that dividends will grow at a constant rate may not be valid.
- Second, it does not explicitly consider risk. There is no direct adjustment for the risk associated with the estimated growth. Of course, there is an implicit adjustment for risk as the current stock price is used.

Average Cost of Capital

Once the specific costs of debt, preference, and equity capital are determined, the average cost of capital is calculated as the weighted arithmetic average of these specific costs.

For Naveen Enterprises, the weights applicable to the various sources of finance are as follows:

>	Equity capital	45/100
>	Preference capital	5/100
.	Debt capital	50/100

The average cost of capital is calculated as follows:

Source of finance	Component cost (per cent)	Weight	'Product of component cost and weight
Equity capital	20.00	0.45	9.00
Preference capital	15.00	0.05	0.75
Debt capital	10.50	0.50	5.25
			15.00

FINANCING STRATEGY

7.12 CAPITAL STRUCTURE

The two broad sources of finance available to a firm are: shareholders' funds and loan funds. Shareholders' funds come mainly in the form of equity capital and retained earnings and secondarily in the form of preference capital. Loan funds come in a variety of ways like debenture capital, term loans, deferred credit, fixed deposit, and working capital advance. Ignoring preference capital (which is of minor significance) the basic differences between shareholders' funds (referred to as equity) and loan funds (referred to as debt) are as follow:

Equity	Debt
<ul style="list-style-type: none"> • equity shareholders have a residual claim on the income and wealth of the firm. • Dividend paid to equity shareholders is not a tax deductible payment. 	<ul style="list-style-type: none"> • Lenders have affixed claim in the form of interest and principal amount. • Interest paid to lenders is a tax deductible payment.

What are the key considerations in determining the debt equity ratio (the capital structure) of the firm? The important considerations in planning the capital structure are:

- Earnings per share
- Risk
- Control
- Flexibility
- Nature of assets

Earnings per Share

Earnings per share, which is simply equity earnings divided by the number of outstanding equity shares, is regarded as an important financial number that firms would like to improve. Hence we need to understand how sensitive is earning per share (EPS) to changes in profit before interest and tax (PBIT) under different financing alternatives.

To illustrate the relationship between PBIT and EPS under alternative financing plans, let us consider the following data for Falcon Limited.

Existing capital structure:	10 million equity shares, per value Rs.10 each
Tax rate	50 per cent

Falcon Limited plans to raise additional capital of Rs.100 million for financing an expansion project. In this context, it is evaluating two alternative financing plans; (i) issue of equity shares (10 million equity shares of Rs.10 per share), and (ii) issue of debentures carrying 14 per cent interest.

What will be the EPS under the two alternative financing plans for two levels for PBIT, say Rs.20 million and rs.40 million? Table 7.33 shows the value of EPS at these two levels of PBIT under the alternative financing plans.

Table 7.33 Earnings per Earnings per Share under alternative Financing Plans

	Equity Financing		Debt Financing	
	PBIT	PBIT	PBIT	PBIT
	20,000,000	40,000,000	20,000,000	40,000,000
Interest			14,000,000	14,000,000
Profit before tax	20,000,000	40,000,000	6,000,000	26,000,000
Tax	10,000,000	20,000,000	3,000,000	13,000,000
Profit after tax	10,000,000	20,000,000	3,000,000	13,000,000
No. of equity shares	20,000,000	20,000,000	10,000,000	10,000,000
EPS	0.50	1.00	0.30	1.30

In general, the relationship between profit before interest and taxes and earnings per share is as follows:

$$\text{Earnings per share} = \frac{[\text{PBIT} - \text{interest}] (1 - \text{Tax rate}) - \text{Preference dividend}}{\text{Number of equity shares}}$$

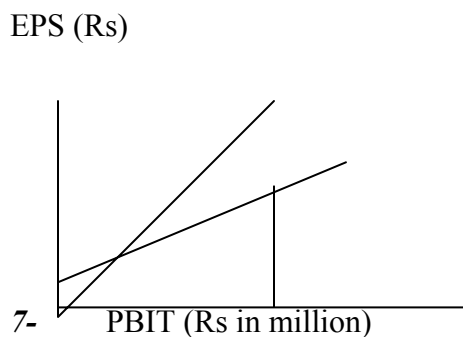
Number of equity shares

The break-even PBIT for the two alternative financing plans is the level of PBIT at which EPS is the same under both the financing plans. It can be graphically obtained by plotting the relationship between PBIT and EPS under the two alternatives and noting the point of intersection. This is shown in Fig 7.7 for the example of Falcon limited. From this figure we find that the break-even level of PBIT is Rs.28 million. If PBIT is below Rs 28 million equity financing is preferable to debenture financing; if PBIT is higher than Rs.28 million, the opposite holds.

Risk

The two principal sources of risk in a firm are business risk and financial risk.

Fig 7.7 Break-even PBIT Level



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Business risk refers to the variability of profit before interest and taxes. It is influenced, inter alia, by the following factors.

- *Demand Variability* Other things being equal, the higher the variability of demand for the products manufactured by the firm, the higher is its business risk.
- *Price Variability* A firm which is exposed to a higher degree of risk is characterised by a higher degree of business risk in comparison with similar firms which are exposed to lesser volatility for the prices of their products.
- *Variability of Input Prices* When input prices are highly variable; business risk tends to be high.

- *Proportion of Fixed Costs* If fixed costs represent a substantial proportion of total costs, other being equal, business risk is likely to be high. This is because when fixed costs are high, PBIT is more sensitive to variations in demand.

Financial risk represents the risk emanating from financial leverage. When a firm employs a high proportion of debt in its capital structure, i.e. when it has a high degree of financial leverage, it carries a high burden of fixed financial commitment. Equity shareholders, who have a residual interest in the income and wealth of the firm, are naturally exposed to the risk arising from such fixed commitments. Equity shareholders face this risk, also referred to as financial risk, in addition to business risk. Generally, the affairs of the firm are, or should be, managed in such a way that the total risk borne by equity shareholders, which consists of business risk plus financial risk, is not unduly high. This implies that if the firm is exposed to a high degree of business risk, its financial risk should be kept low. On the other hand, if the firm has a low business risk profile, it can assume more financial risk.

Control

Consider the case of a firm which presently has an equity capital of 1000 owned entirely by the original promoters. If the firm wants to raise additional capital, say another 1000, it may go for debt finance, or a rights issue of equity capital, or a public issue of equity capital, or a combination of two or more of these. The pros and cons of the three basic ways of raising additional finance are shown below:

	Pros	Cons
Rights issue of equity capital	No dilution of control	Severe limits on financing
Debt capital	No financial risk No dilution of control Lower cost	Higher cost Financial risk
Public issue of equity capital	No financial risk	Dilution of control Higher cost

Since the rights issue option severely limits the financing ability of the firm – the present owners may lack resources or inclination or both – the options which may merit serious considerations are debt capital and public issue of equity capital. In evaluating these options, among other things, the issue of control is important.

Flexibility

Flexibility refers to the ability of a firm to raise capital from any source it wishes to tap. It provides manipulability to the finance manager. Generally, if the return earned on equity is satisfactory, the firm can raise further equity capital as there is no restriction on the amount of equity capital a firm can raise. However, as the debt equity ratio is normally not permitted to exceed a certain level (which may be specified by some regulatory authority, or determined by financial institutions, or indicated by the capital market), the firm cannot presume that it can always raise further capital by issuing debt securities. Hence, flexibility for practical purposes may mean that the firm does not exhaust fully its debt capacity. Put differently, it implies that the firm maintains reserve-borrowing power to enable it to raise debt capital to fund unforeseen needs.

Nature of Assets

The nature of a firm's assets has an important bearing on its capital structure. If the assets are primarily tangible (plant and machinery and buildings), debt finance is used more. For example, electric utility companies use more debt because their assets are mainly tangible, physical in nature. On the other hand, if the assets are primarily intangible (brands and technical know-how) debt finance is used less. For example, software companies use very little debt as their assets are mainly intangible. What explains the link between the nature of assets and the use of debt finance? The major explanation is that lenders are more willing to lend against tangible assets and less inclined to lend against intangible assets.

A Checklist

When should the firm use more equity and when should the firm use more debt. Here is a checklist:

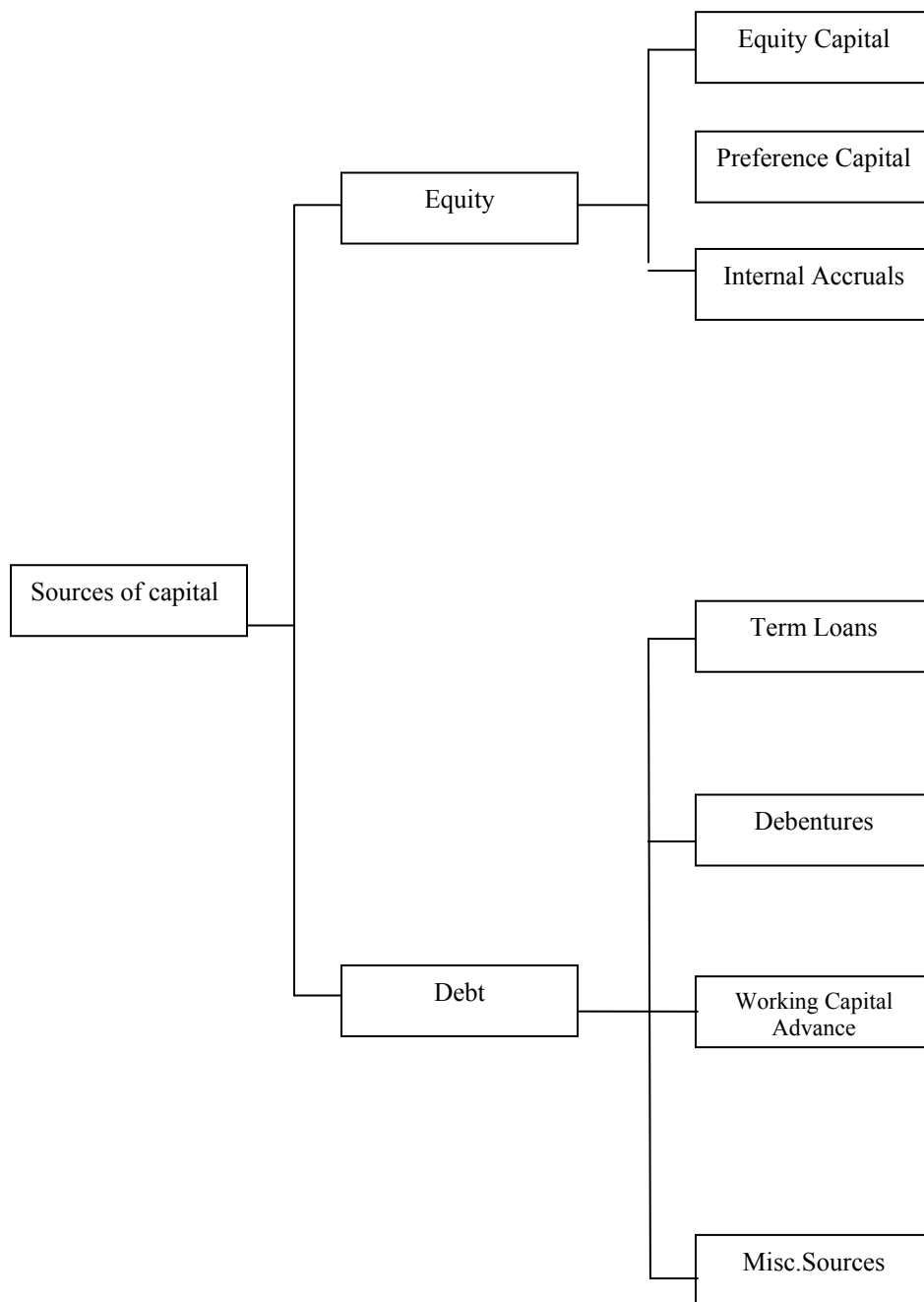
Use more equity when	Use more debt when
<ul style="list-style-type: none"> • The corporate tax rate applicable to the firm is negligible • Business risk exposure is high • Dilution of control is not an important issue. • The assets of the firm are mostly intangible. • The firm has many valuable growth options. 	<ul style="list-style-type: none"> • The corporate tax rate applicable to the firm is high. • Business risk exposure is low. • Dilution of control is an important issue. • The assets of the firm are mostly tangible. • The firm has few growth options.

FINANCING INSTRUMENTS

Equity and debt come in a variety of forms and are raised in different ways. The important forms are given in Fig 7.8 which shows the menu of financing available to a firm. The various forms of financing have been discussed in greater detail in the following chapter.

Public and Private Sources of Capital

A firm can raise equity and debt capital from both public and private sources. Capital raised from public sources is in the form of

Fig 7.8 Menu of Financing

securities offered to public through an offer document filed with the Securities Exchange Board of India. These securities can be traded on public secondary markets like the national Stock Exchange or the Bombay Stock Exchange, which are recognized stock exchanges that facilitate the trading of public securities. Private capital comes either in the form of loans given by banks and financial institutions or in the form of securities like equity shares, preference shares, and debentures which are privately placed with a small group of sophisticated investors like venture capital firms, financial institutions, insurance companies, mutual funds, and wealthy individuals.

The Typical Pattern of Financing

When a company is formed, it first issues equity shares to the promoters (founders) and also, in most cases, raises loans from banks, financial institutions, and other sources. As the need for financing increases the company may issue shares and debentures privately to promoters' relatives, friends, business partners, employees, financial institutions, banks, mutual funds, venture capital funds, and others-venture capital funds are likely to be an important source of finance for a nascent venture. Such investors are specific and small in number. As the company grows further, it may have to raise capital from the public. Once the company decides to go public, its options, in terms of markets, widen. It can access the domestic market, international market, and foreign market. Apart from equity shares, a firm may issue preference shares and debentures to the general investment public through a public issue.

METHODS FOR RAISING FINANCES

The market for financial securities may be divided into two segments: the primary market and the secondary market. New issues are made in the primary market whereas outstanding issues are traded in the secondary market. There are three ways in which a company may raise finances in the primary market: (a) public issue, (b) rights issue, and (c) private placement or preferential allotment.

Public Issue

A public issue involves sale of securities to the members of the public. The first public offering of equity shares of a company, which is followed by a listing of its shares on the stock market, is called the initial public offering (IPO). Subsequent offerings are called seasonal offerings.

Initial Public offering: The decision to go public (or more precisely the decision to make an IPO so that the securities of the company are listed on the stock market and publicly traded) is a very important decision which calls for carefully weighing the benefits against costs.

Benefits	Costs
<ul style="list-style-type: none"> • Access to a larger pool of capital • Respectability • Lower cost of capital compared to private placement • Liquidity 	<ul style="list-style-type: none"> • Dilution • Loss of flexibility • Disclosures and accountability • Periodic costs

Eligibility for IPOs An Indian company, excluding certain banks, and infrastructure companies can, make an IPO if it satisfies the following conditions:

- The company has a certain track profitability and a certain minimum net worth.
- The securities are compulsorily listed on a recognized stock exchange, which means that a certain minimum percent of each class of securities is offered to the public.
- The promoter group (promoters, directors, friends, relatives, associates, etc) is required to make a certain minimum contribution to the post-issue capital.
- The promoters' contribution to equity is subject to a certain lock-in period.

Principal steps in an IPO: A public issue involves sale of securities to the members of the public. It entails a fairly elaborate process involving the following steps after the proposed issue is approved by the board of directors and shareholders:

- Appoint the lead manager / s.
- Appoint other intermediaries like co-managers, underwriters, bankers, brokers, and registrars.
- Prepare the prospectus and file the same with the Registrar of Companies and SEBI.
- Print the prospectus and dispatch the same to brokers.
- Make the statutory announcements.
- Collect and process the applications.
- Establish the liability of underwriters.
- Allot shares.
- Get the issue listed.

Cost The cost of an IPO is normally between 6 and 12 per cent depending on the size of the issue and the level of marketing effort. The important expenses incurred for public issue are: underwriting expenses, brokerage, fees for the managers and registrars, printing and postage expenses, advertising and publicity expenses, listing fees, and stamp duty.

Seasoned Offering For most companies their IPO is seldom their last public issue. As companies grow, they are likely to make further trips to the capital market with issues of debt and equity. These issues are likely to be public issues offered to investors at large or rights issues or private placement or preferential allotment.

The procedure for a public issue by a listed company (seasoned offering) is similar to that of an IPO. Hence all the steps involved in an IPO are applicable to a public issue by a listed company. However, a public issue by a listed company is subject of fewer regulations when compared to an IPO (except when the post-issue net worth grows to more than five times the pre-issue net worth). This is evident from the following:

- A public issue by a company which has been listed on a stock exchange for at least three years and has a track record of dividend payment for at least three immediate preceding years does not require the promoters' contribution, provided the relevant information is disclosed in the offer document.

Rights Issue

A rights issue involves selling securities in the primary market by issuing rights to the existing shareholders. When a company issues additional equity capital, it has to be offered in the first instance to the existing shareholders on a pro-rata basis. This is required under section 81 of the Companies Act, 1956. The shareholders, however, may by a special resolution forfeit this right, partially or fully, to enable a company to issue additional capital to the public.

Procedure for Rights Issue A company making a rights issue sends a letter of offer along with a composite application form consisting of four forms (A, B, C and D) to the shareholders. Form A is meant for the acceptance of the rights and application of additional shares. This form also shows the number of rights shares the shareholder is entitled to. It also has a column through which a request for additional shares may be made. Form B is to be used if the shareholder wants to renounce the rights in favour of someone else. Form C is meant for application by the renounces in whose favour the rights have been renounced, by the original allottee, through Form B. Form D is to be issued to make a request for split forms. The composite application form must be mailed to the company within a specific period, which is usually 30 days.

Private Placement or Preferential Allotment

In a private placement, funds are raised in the primary market by issuing securities privately to some investors without resorting to underwriting. The investors in this case may be financial institutions, commercial banks, other companies, and shareholders of promoting companies, and friends and associates of the promoters. The merits of private placement are: (a) The process of raising funds is fairly simple. The elaborate procedure required in the case of a public issue is more or less bypassed. (b) The issue cost is minimal. (c) In the case of a debenture issue, negotiated directly between the issuing company and the few investors, there may be greater flexibility with respect to terms and conditions. The disadvantages of private placement are: (a) The quantum of funds that

can be raised may be rather limited. (b) The cost of capital of funds raised by way of private placement may be somewhat higher.

Private Placement of Debentures Private placement of debentures has become very popular in recent years. The principal buyers of such debentures have been mutual funds, insurance companies, and financial institutions. Army group Insurance, Navy Group insurance, Air Group Insurance, and so on. The phenomenal growth of private placement of debentures may be attributed to the following factors:

Accessibility Almost every company can use the private placement route. There is no need for credit rating.

Flexibility In a private placement, there is greater flexibility in working out the terms of issue.

Speed A private placement requires much less time than a public issue.

Lower issue costs: The issue costs of a private placement are substantially less.

How Do the Three Methods compare

How do the three methods compare broadly in terms of the amount that can be raised, the cost of issue, dilution of control, degree of under-pricing, and market perception. Table 7.34 presents a summary comparison for equity issue. As far as a debt issue is concerned, dilution of control is a non-issue and the market perception is positive under all the methods.

Table 7.34 Summary comparison of the Three Methods

	Public issue	Rights Issue	Private Placement
Amount that can be raised	Large	Moderate	Moderate
Cost of issue	High	Negligible	Negligible
Dilution of control	Yes	No	Yes
Degree of under pricing	Large	Irrelevant	Small
Market Perception	Negative	Neutral	Neutral

MARKETS

A firm planning to raise finances may tap one or more of the following capital markets:

Indian capital Market A firm accessing the Indian capital market has to conform to the regulations of the Securities and Exchange Board of India (SEBI).

Euro Capital market The euro capital market is a global market beyond the purview of any national regulatory body. Many firms in India have accessed this market since the early 1990s using instruments like Global depository Receipts (GDRs) and Euro Convertible Bonds (ECBs). Firms interested in accessing this market have to take the approvals of Ministry of Finance, foreign Investment Promotion Board, and Reserve bank of India.

Foreign domestic Capital Market Some Indian firms have accessed or are in the process of accessing the domestic capital market of US (through instruments like Yankee bonds and American Depository Receipts), U.K, and Japan. Obviously, an Indian firm interested in accessing a foreign domestic capital market has to obtain clearances from Indian authorities as well as the regulatory bodies of the foreign country.

How do the three markets compare in terms of access, market size, cost of issue, disclosure and transparency requirements, and prices/rates? Table 7.35 provides a summary comparison of the three markets.

Table 7.35 A Summary Comparison of the Three Markets

	Indian Capital Market	Euro Capital Market	Foreign Domestic market
Access	Easy	Restricted	Highly restricted
Market	Small	Large	Large
Cost of Issue	High	Low	Low
Disclosure and transparency	Less onerous	Onerous	Highly onerous
Prices / Rates	Not so attractive	Attractive	More attractive

PRICING AND TIMING

Along with the choice of instrument, market, and mode, the firm has to determine when and at what price should its issue be made. Since pricing and timing are closely inter-related they may be discussed together.

If the capital market is efficient in the sense that the market price is always equal to the intrinsic value, the simple guideline with respect to pricing and timing would be: “ Raise finances whenever they are required by issuing securities at prevailing market prices”.

Since the market price and intrinsic value may diverge in real life situations, pricing and timing are important issues. Bear in mind the following guidelines while resolving these issues.

Decouple Financing and Investment Decisions Opportunities for smart moves on investment and financing side of the business often do not synchronise. Hence financing decisions should be decoupled from investment decisions, As Warren Buffett says: “Therefore, we simply borrow when conditions seem non-oppressive and hope that we will later find intelligent expansion or acquisition opportunities, which as we have said are more likely to pop up when conditions in the debt market are clearly oppressive. Out basic principle is that if you want to shoot rare, fast moving, elephants, you should always carry a loaded gun”.

Never Be Greedy If present conditions are favourable for a certain type of financing, take advantage of it. Driven by greed, do not wait for an even better possible tomorrow. The advice of Bernard Baruch formulated for the stock market investor applies equally well to the participant in financial market: “Leave the first 1p per cent and the last 10 per cent of someone else.”

Ensure Inter-generational Fairness Tapping the equity market when it is buoyant does not mean that the firm should price its equity issue far above its intrinsic value. If it does so, existing shareholders will benefit at the expense of new shareholders. While it may appear alluring in the short run, it may not be advisable in the long run. Firms which

succumb to such a temptation for immediate gains may eventually alienate new investors and lose credibility in the capital market. To ensure inter-generational fairness among equity shareholders, the firm should price its issue at more or less the intrinsic value and to more or less guarantee an encouraging response to its issue, the firm should approach the market when it feels that the market price is higher than the intrinsic value by a margin of say 20 per cent.

DIVIDEND POLICY

Very broadly, the distribution policy is concerned with issues like how much of its earnings should a firm pay by way of dividends, what are the implications of bonus issues and stock-splits, and when does it make sense to buy back shares.

Key Considerations Influencing Dividend Policy

The key considerations influencing a firm's dividend policy are as follows:

Earnings Prospects If the firm expects its earnings to grow in future it may be inclined to pay more by way of dividends. On the other hand, if it is uncertain about its earnings prospects it may pay less by way of dividends.

Funding Requirements An important factor influencing the payout ratio of a firm is its requirement for funds in the foreseeable future. This is usually assessed with the help of financial forecasts prepared in the context of long range planning. Generally, firms which have substantial investment opportunities and consequently considerable funding needs tend to keep the dividend payout ratio low to conserve resources for growth.

Dividend Record The past dividend record of a firm has a bearing on its current dividend payment. Firms generally pursue a policy of gradually varying (this mostly implies increasing but occasionally means decreasing) the rupee level of dividend over time.

Liquidity Position Dividends entail cash payment. Hence, the liquidity position of the firm has a bearing on its dividend decision. A firm may be unable to distribute more than a small fraction of its earnings, despite its desire to do so, if it is hard pressed for liquidity.

Shareholder Preference The preference of shareholders may influence the dividend payout ratio of the firm. When equity shareholders have greater interest in current dividend vis-à-vis capital gains, the firm may be inclined to follow a liberal dividend payout policy. On the other hand, if equity shareholders have a strong preference for capital gains, the firm may plough back a larger proportion of its earnings.

Control External financing, unless it is through a rights issue, involves dilution of control. If external finances are raised through a public issue of equity capital, the existing shareholders will have to share control with the new shareholders. Internal financing by way of retained earnings, on the other hand, leads to no dilution of control. Hence, if the shareholders and management of the firm are averse to dilution of control, the firm should rely more on retained earnings.

Bonus Shares

Share issued to existing shareholders as a result of the capitalization of reserves are called bonus shares. Table 7.36 illustrates the nature of this capitalization.

Table 7.36 *Effect of a Bonus issue on the Equity Portion of the Balance Sheet*

<i>Part A: Equity Portion before the Bonus Issue</i>	
Paid up Share Capital (1,000,000 shares of Rs.10 each fully paid)	Rs.10,000,000
Reserves and Surplus	Rs.30,000,000
<i>Part B: Equity Portion after the Bonus Issue in the Ratio 1:1</i>	
Paid up Share Capital (2,000,000 shares of Rs.10 each fully paid)	Rs.20,000,000
Reserves and Surplus	Rs.20,000,000

In the wake of the bonus issue:

- The shareholders' proportional ownership remains unchanged.
- The book value per share, the earnings per share, and the market price per share decrease, but the number of shares increases.

From the above it appears that the issue of bonus shares is more or less a financial gimmick without any real impact of the welfare of equity shareholders. Yet, firms do issue bonus shares and shareholders eagerly look forward to such issues. Why? The primary reason is that shareholders regard a bonus issue as a firm indication that the prospects of the company have brightened. Further, they feel reassured that the

management is investor friendly. A secondary reason is that the bonus issue brings the price of the share in a more popular trading range.

Stock Splits

In a stock split, the par value per share is reduced and the number of shares is increased proportionately. Table 7.37 illustrates the nature of this change.

Table 7.37 *Effects of a Stock Split on the Equity Portion of the Balance Sheet.*

<i>Part A: Equity Portion of the Balance Sheet</i>	
Paid up Share Capital	Rs.5,000,000
(1,000,000 shares of Rs.50 each fully paid)	
Reserves and Surplus	Rs.10,000,000
<i>Part B: Equity Portion after Stock Split in the Ratio 5:1</i>	
Paid up Share Capital	Rs.5,000,000
(5,000,000 shares of Rs.10 each fully paid)	
Reserves and Surplus	Rs.10,000,000

Comparison between Bonus Issue and Stock Split

A comparison between a bonus issue and a stock split given below:

<i>Bonus Issue</i>	<i>Stock Split</i>
<ul style="list-style-type: none"> • The par value of the stock remains constant. • A part of reserves is capitalized. • The shareholders' proportional ownership remains unchanged. • The book value per share, the earnings per share, and the market price per share decline. • The market price per share is brought within a more popular trading range. 	<ul style="list-style-type: none"> • The par value of the stock is reduced. • There is no capitalization of reserves. • The shareholders' proportional ownership remains unchanged. • The book value per share, the earnings per share, and market price per share decline. • The market price per share is brought within a more popular trading range.

SUMMARY

Accounting is the process of identifying, measuring and communicating economic information to permit informed judgments and decisions by users of the information. Nowadays, Profit and loss account, Balance Sheet, and Statement of Changes in Financial Position are important in the accounting process. Accounting, especially, cost accounting, as a tool of management, is an integral part of the management process. Cost accounting records relevant data from production and other activities on a regular basis and reports these data to management for managing the undertaking. Cost accounting is the processing and evaluation of monetary and non-monetary data to provide information for internal planning, control of business operations, managerial decisions and special analysis, external reporting. Economic Order Quantity and Re order level make ease accountants and financial managers in the process of placing an order with the answer of questions when and how many.

The two types of inventory systems, **perpetual inventory method** requires a continuous record of additions to or reductions in materials, work-in-progress, and cost of good sold on a day-to-day basis and the stock-taking task which is long and costly is avoided under this method; Under the **periodic method**, the entire book inventory is verified at a given date by an actual count of materials on hand and this physical inventory is usually taken near the end of the accounting period. The difference between Cost accounting and Managerial accounting makes clear its usages. Cost accounting largely uses data about production, sales, wages, and overhead services. Managerial accounting utilizes the same (and also additional) data to prepare budgets, performance reports, and control reports and data analyses for decision-making purposes. Cost- Volume-Profit (CVP) analysis is an important tool that provides the management with useful information for managerial planning and decision-making. A break-even analysis is performed to identify the level of operations at which the .entity has covered all costs but has not yet earned any profit. The break-even point identifies the volume of activity at which total revenues equal total costs. This is an important point to the management because it represents a minimum

acceptable level of operations and it indicates that profitable operations can only result when the level of activity exceeds the break-even point.

FOR DISCUSSION

1. Explain briefly about the accounting concepts and principles.
2. What are the objectives of cost accounting?
3. Briefly explain the elements of cost.
4. Define Economic Order Quantity.
5. What are the types of inventory systems? Summarize the concepts and advantages of each with distinguishable form.
6. Explain the types of wage systems briefly.
7. What are the differences between cost accounting and managerial accounting?
8. Explain the role of management process on managerial accounting.
9. What are the differences between financial accounting and managerial accounting?
10. What is CVP analysis? Explain its different techniques.
11. What is break even analysis? In what circumstances its useful is unavoidable in decision making process? Explain its advantages and disadvantages.
12. Explain briefly about the fixed and flexible budgeting.
13. What are the types of budgets?
14. What is zero base budgeting? Explain its advantages and disadvantages.
15. What is cost of capital?

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Chapter 8

PROJECT MANAGEMENT

PROJECT MANAGEMENT

SCOPE OF THE COURSE

After reading chapter 8, you should be able to:

- Understand the basic needs for project planning
- Explain the characteristics of project planning
- Understand Critical Path Method
- Understand PERT

INTRODUCTION

8.1 WHAT IS A PROJECT?

“A project is a temporary endeavor undertaken to achieve a particular aim. Every project has a definite beginning and a definite end.”

From the Project Management Institute

www.pmi.com

What is Project Management?

Project management is the application of knowledge, skills, tools and techniques ... in order to meet the requirements of the particular project.

From [A Guide to the Project Management Body of Knowledge](#) (2000 Edition, Project Management Institute (PMI®) December 2000)

8.2 WHAT IS PROJECT PLANNING

Project Planning in general can best be described as the function of selecting the enterprise objectives and establishing the policies, procedures and programs necessary for achieving them.

Characteristics of Project Planning

- Project Planning must be systematic, flexible, enough to handle unique activities, disciplined through reviews and controls and capable of accepting multifunctional inputs.
- Task is required to be well understood prior to being performed, much of the work can be preplanned

- During the actual task execution more knowledge is learned that in turn leads to changes in resources allocations schedules and priorities.
- The more uncertain the task the greater the amount of information that must be processed in order to ensure effective performance.

Poor Project Planning

- Project initiation
- Wild Enthusiasm
- Chaos
- Search for the guilty
- Punishment of the innocent
- Promotion of the nonparticipants
- Unclear definition of the requirements

Basic need for Project Planning

- To eliminate or reduce uncertainty
- To improve efficiency of the operation
- To obtain better understanding of the objectives
- To provide a basis for monitoring and controlling work
- The competitive situation in the area like
- *Marketing, Research and Development*
- *Production, Financing and Personnel*
- *Management Structure etc.*
- *Agreement on purpose*
- *Assignment and acceptance of individual responsibilities*
- *Coordination of work activities*
- *Increased commitment to group goals*
- *Lateral Communications*
- *Assignment and acceptance of group responsibilities*

The statement of work (SOW)

- The SOW is a narrative description of the work required for the project. It includes the objectives of the project A brief description of the work the funding constraint if one exists and the specifications and schedule.
- It includes: Start date, End Date, Major Milestones,Written reports (data items).
- Common causes of misinterpretation:
 - Mixing tasks, specifications, approvals and special instructions
 - Using imprecise language (nearly, optimum, approximately etc.)
 - No pattern,structure or chronological order
 - Wide variation in size of tasks
 - Wide variation in how to describe details of the work
 - Failing to get third –party review

The project manager or his designees should review the document that authorize the project and define its objectives. As a convenience a related studies should be prepared together with samples of any Similar SOW'S and related coding should be used. A copy of the Work Breakdown Structure (WBS) should be obtained. Coordination between Contract work breakdown structure (CWBS) elements and the SOW should commence. Each task element of the preliminary CWBS should be explained in SOW. The project manager should establish a SOW preparation team consisting of personnel from he deems appropriate.

Or experts in the area of technical, financial fabrication test, logistic, configuration management operations safety, reliability and quality assurance. Before work has start on SOW, project manager should brief CWBS and the nature of the contemplated SOW. This Is the baseline to proceed further. The identified tasks may be assigned to team members. Team members should develop specifications and Technical requirements documentation that may apply to various elements of the proposed procurement.

Checklist for SOW Preparation:

- Is the SOW specific enough to permit a contractor to Make a tabulation and summary of manpower and resources needed to accomplish each SOW task element.
- Are specific duties of the contractor stated so he will know what is required?
- Are all parts of the SOW so written that it is clear to both the parties.
- Is proper reference of document is described?
- Are any specifications or exhibits applicable in whole or in part? If so are they cited and referred to the appropriate SOW element.
- Are directions clearly distinguishable from general information.
- Is there a time-phased data requirement for each deliverable item? If elapsed time is used does it specify calender or work days?
- Are proper quantities shown?Have headings been checked for format and grammer? Are subheadings are comparable?
- Have appropriate portions of procurement regulations been followed?
- Can SOW task or /contract line items and configuration item breakouts at lower level so they can be summarized to CWBS elements.
- Have all requirements for data been specified separately in a data requirements appendix or its equivalent? Have all extraneous data requirements been eliminated?
- Are security requirements adequately covered if required?
- Has its availability to contractors been specified.
- Finally, there should be management review of the SOW preparation and interpretation

8.3 WORK BREAKDOWN STRUCTURE (WBS)

The project manager must structure the work into small elements that are:

- Manageable, in that specific authority and responsibility can be assigned
- Independent or with minimum interfacing with and dependence on other ongoing elements.
- Integratable, so that the total package can be seen
- Measurable in terms of progress

The first major step in the planning process after project requirements definition is the development of the work breakdown structure(WBS). The WBS is the single most important element because it provides a common framework from which:

- The total program can be described as a summation of subdivided elements
- Planning can be performed
- Costs and budgets can be established
- Time, cost and performance can be tracked
- Objectives can be linked to company
- resources in a logical manner
- Schedules and status-reporting procedures can be established
- Network construction and control planning can be initiated
- The responsibility assignments for each element can be established.
- A copy of the WBS should be obtained .
- Coordination between CWBS elements and the sow should commence.
- Each task element of the preliminary CWBS should be explained in SOW.
- The project manager should establish a SOW preparation team consisting of personnel from he deems appropriate.

Check List for Effective Work Breakdown Structure (WBS)

- Has WBS developed by subdividing the total effort into discrete and logical supplements.
- Check the proposed WBS satisfies both functional engineering-manufacturing-test)and program / project (hardware, services etc.) requirements including recurring and nonrecurring costs.
- Check to determine if the WBS provides for logical subdivision of all project work.
- Establish assignment of responsibilities for all identified effort to specific organizations.

PROJECT SPECIFICATIONS

Project specification is a part of statement of work. Specifications are used for man-hour, equipment and material estimates. Small changes in a specification can cause large cost

overrun. It avoids surprises for the customer downstream. The specifications must be most current revision. It is not uncommon for a customer to hire outside agencies to evaluate the specifications. Specifications are in fact standards for pricing out a proposal

MILESTONE SCHEDULES

Milestone schedules contain such information as:

- Project start date
- Project end date
- Other major milestones
- Data items

8.4 ESTIMATING PROJECTS

There will be higher degree of uncertainty and more inputs to the estimates have to be treated as variable rather than constants.

The changes that have the greatest effects can be discussed in terms of the systems model of project activities.

NAME	NATURE	ROLE	ACCURACY
Rough/finger-in-the air/ballpark	Much uncertainty As what is involved	Early check on feasibility of brief	+or-25
As-butts	As was carried out previously with Some Amendment	With an appropriate contingency factor	+ or - 15
Detailed Estimates	Some solid initial work is carried out	proposals	+or-10

To finish	At ending stage	Additional fund	+or- 5
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COSTING PROPOSAL

There are two types of approaches to the preparation of costing:

1. Ground –up-costing

2. Top-down-Costing.

Ground-up-Costing: The estimate of each level in the work breakdown structure are compiled and added together by each level of supervision in the project hierarchy

Top-down-costing: The amount of money is allocated to complete the project activities and this has to be split between the sub-projects. The allocation is either based on senior management estimates or through the use of target costing.

Top Down

Project Manager
Allocates budgets
To sub projects

Ground-up

Project manager collects Estimates.

TYPES OF ESTIMATES

- Definitive
- Capital Cost
- Appropriation(with capital cost)
- Appropriation
- Feasibility
- Order of magnitude

ACTIVITY LEVEL COST

Time: The direct input of labor into activities

Materials: Consumables and other items used in the process

Capital Equipment

Indirect Expenses: Transportation, Training

Overheads: Provision of an office financial and legal support and staff cost.

TECHNIQUES FOR TIME DETERMINATION

1. DIRECT WORK MEASUREMENT
2. WORK SAMPLING
3. SYNTHETIC ESTIMATION
4. LEARNING CURVE CALCULATIONS

ELEMENTS OF COST

Price = direct material + direct labour + projects overheads + general overheads + profit

BUDGET

A written statement of money: where it is drawn from, its amount how it is to be spent

-Collins English Dictionary

Category of Budgets: Labour, materials, consumables, capital expenditure, travel - Subsistence, etc.

Resource Analysis

-Crashing

-Resource allocation and smoothing

CRASHING

It is part of the project how to carry out the project in less time. Shortening one or more project activities.

-Provide an incentive for work to be completed early eg. road work.

- Add additional resources such as extra people or machine capacity provide over time additional contract etc.

- Parallel activities

- Reduce the level of technological change
- Compromise in terms of time or specifications or to commit extra resource

How to do ?

- Personal supervision of one or more activities which ensures an early completion
- Find out absolute latest time required
- -Discussion with the members of the projects

8.5 RESOURCE ALLOCATION AND SMOOTHING

- Resources are to be properly utilized
- Use responsibility matrix and responsibility matrix with resource loading

CPM/PERT

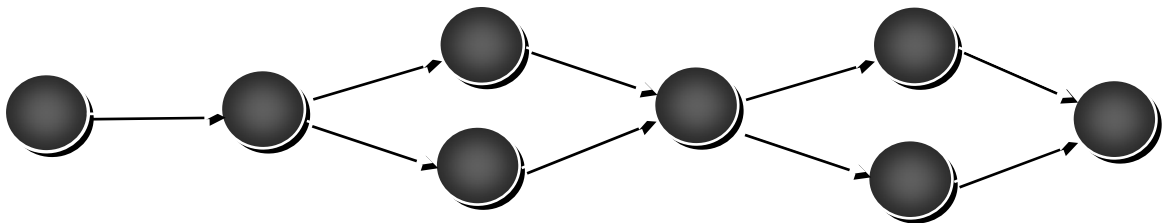
Critical Path Method (CPM)

- Designed to provide intense micro-control
- The system is dynamic; it continues to provide periodic reports as the project progresses
- It involves three Basic Steps:
 - ✓ It defines the job to be done
 - ✓ It integrates them in a logical sequence
 - ✓ It controls the progress of project plan.

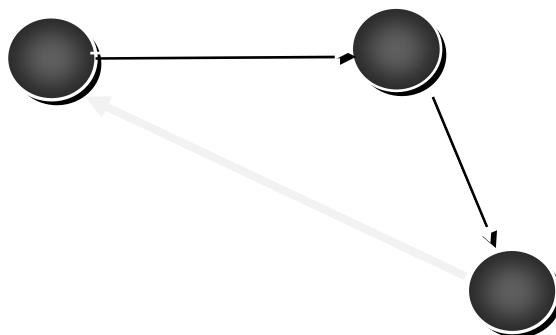
Manager's View of CPM

- **Activity**
 - A task or a certain amount of work required in the project
 - Requires time to complete
 - Represented by an arrow
- **Parallel activity**
 - Activities that start after a particular activity and progresses along with it but finishes only after that activity is over.(E.g. *Construction of a wall* and *Plastering*)

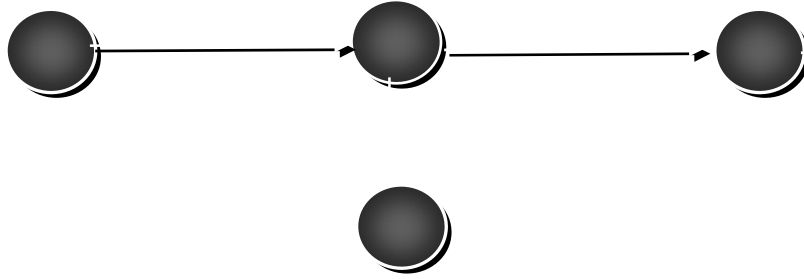
- **Dummy Activity**
 - Indicates only precedence relationships
 - Does not require any time of effort
- **Event**
 - Signals the beginning or ending of an activity
 - Designates a point in time
 - Represented by a circle (node)
- **Network**
 - Shows the sequential relationships among activities using nodes and arrows



- ***Loops and Dangling***
 - **Looping**: Avoid looping by checking the precedence relationship of activities by numbering them in logical order (*Non Cyclic*)



- **Dangling**: activities other than initial and final don't have successor events.



CPM Terminology

- Path
 - A connected sequence of activities leading from the starting event to the ending event
- Critical Path
 - The longest path (time);
 - determines the project duration
 - Sequence of activities along which there is no free time.
- Critical Activities
 - All of the activities that make up the critical path
- Earliest Start (ES)
 - The earliest that an activity can begin; assumes all preceding activities have been completed
- Earliest Finish (EF)
 - $ES + \text{activity time}$
- Latest Finish (LF)
 - The latest that an activity can finish and not change the project completion time
- Latest Start (LS)
 - $LF - \text{activity time}$

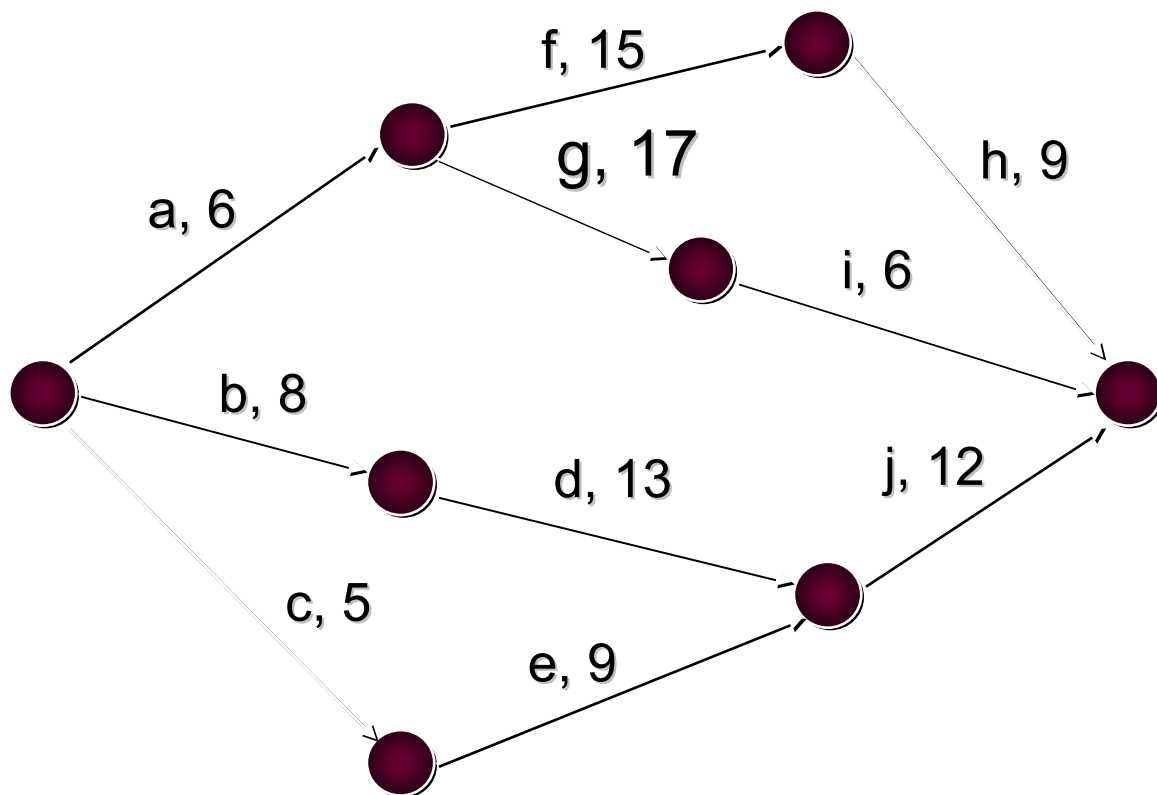
Steps in CPM Analysis

- Draw the CPM network
 - A graphic view of the relationships among the required activities

- Analyze the paths through the network
 - Determine the length of each path (the time required to complete each path)
 - Starting at the beginning of the network and working toward the end (from left to right), determine the ES and the EF for each activity
- Path analysis (continued)
 - Identify the critical path(s) (the longest path[s] through the network)
 - The critical path(s) determines how long the project will take
- Determine the slack for each activity
 - Working from the end of the project network (from right to left), find the LF and the LS for each activity
 - Compute the activity's slack
$$\text{slack} = \text{LS} - \text{ES} = \text{LF} - \text{EF}$$
 - Slack is the maximum amount of time that this activity can be delay in its completion before it becomes a critical activity, i.e., delays completion of the project

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CPM Network

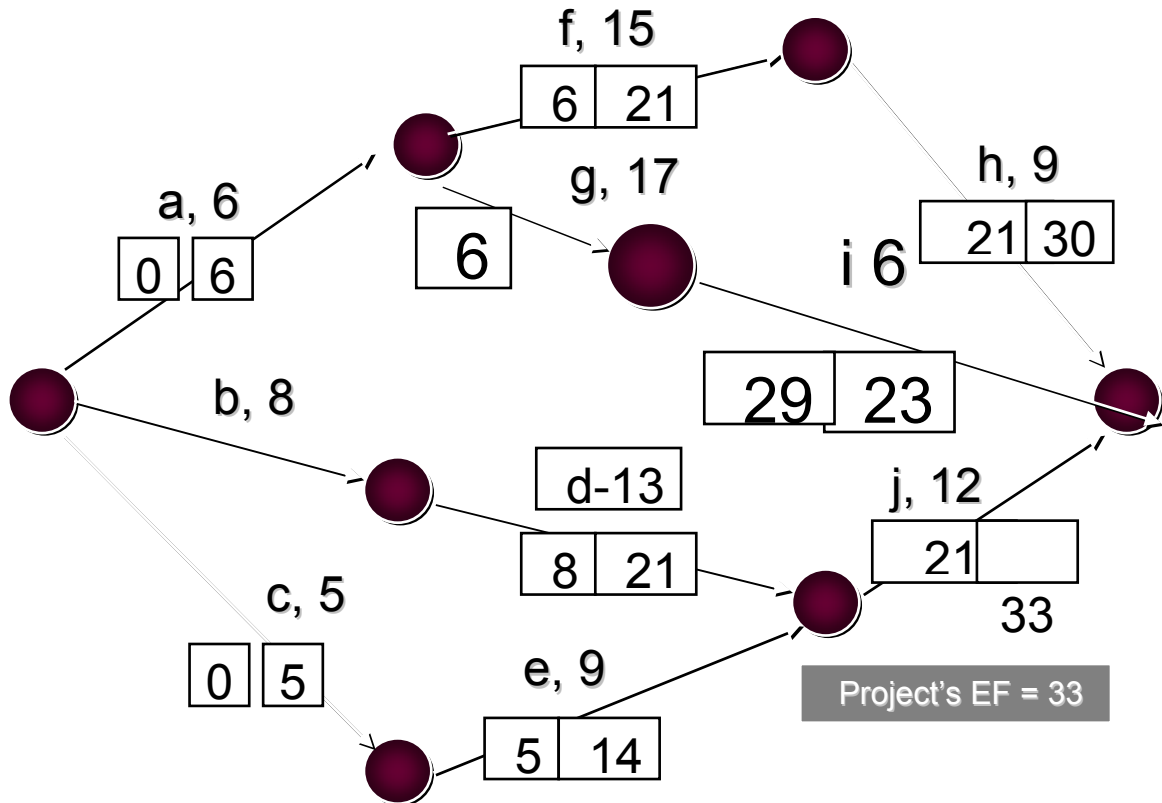


- Paths Enumerated

Path	Length of Path
a-f-h	$6 + 15 + 9 = 30$
a-g-I	$6 + 17 + 6 = 29$
b-d-j	$8 + 13 + 12 = 33^*$
c-e-j	$5 + 9 + 12 = 26$

*Critical path

- ES and EF Times



Program Evaluation and Review Technique (PERT)

- The technique is based on the assumption that an activity's duration follows a probability distribution instead of being a single value.
- The probabilistic information about the activities is translated into probabilistic information about the project.
- Three time estimates are required to compute the parameters of an activity's duration distribution:
 - pessimistic time (t_p) – the time the activity would take if things did not go well
 - most likely time (t_m) – the consensus best estimate of the activity's duration
 - optimistic time (t_o) – the time the activity would take if things did go well

Steps in PERT Analysis

- Draw the network.
- Analyze the paths through the network and find the critical path.
- The length of the critical path is the mean of the project duration probability distribution which is assumed to be normal.
- The standard deviation of the project duration probability distribution is computed by adding the variances of the critical activities (all of the activities that make up the critical path) and taking the square root of that sum
- Probability computations can now be made using the normal distribution table.

PERT Example

<u>Activity</u>	<u>Immed. Predec.</u>	<u>Optimistic Time (Hr.)</u>	<u>Most Likely Time (Hr.)</u>	<u>Pessimistic Time (Hr.)</u>
A	--	4	6	8
B	--	1	4.5	5
C	A	3	3	3
D	A	4	5	6
E	A	0.5	1	1.5
F	B,C	3	4	5
G	B,C	1	1.5	5
H	E,F	5	6	7
I	E,F	2	5	8
J	D,H	2.5	2.75	4.5
K	G,I	3	5	7

Activity Cost-Time Tradeoffs

- Project managers may have the option or requirement to crash the project, or accelerate the completion of the project.
- This is accomplished by reducing the length of the critical path(s).
- The length of the critical path is reduced by reducing the duration of the activities on the critical path.

Cost-Time Tradeoffs

- If each activity requires the expenditure of an amount of money to reduce its duration by one unit of time, then the project manager selects the least cost critical activity, reduces it by one time unit, and traces that change through the remainder of the network.
- As a result of a reduction in an activity's time, a new critical path may be created.
- When there is more than one critical path, each of the critical paths must be reduced.
- If the length of the project needs to be reduced further, the process is repeated.

8.6 COMPUTER SOFTWARE FOR PROJECT MANAGEMENT

- Artemis Views (Artemis Management Systems)
- FastTrack Schedule (AEC Software)
- Microsoft Project (Microsoft Corp.)
- Oracle Projects (Oracle Corp.)
- PowerProject (ASTA Development)
- Primavera Project Planner (Primavera Systems) SuperProject (Computer Associates international)
- Turbo Project (IMSI)

Evaluation of CPM/PERT

- Activities are assumed to be independent.
- It is assumed that there is a precise breaking point where one activity ends and another begins.
- Initially-critical activities might not receive the attention they deserve until it is too late.
- Activity time estimates might be biased.
- The cost of CPM/PERT might not be justified by the value of the information it provides.
- Personnel might not understand the statistical underpinnings of PERT.

Wrap-Up: World-Class Practice

- The project organizations are flexible enough to respond aggressively to business opportunities.
- Personnel are selected and trained to be flexible in moving from department to department and project to project as needed.
- Scheduling and control charts are frequently used because of their simplicity, flexibility, low cost, and effectiveness as communication devices.
- CPM, PERT, and PERT/Cost are also used to provide computerized activity-by-activity planning and control.

Project Feasibility Study

According to P Gopal Krishnan and VE Rama Moorthy The project feasibility study is to be conceived of following point to avoid incomplete and inadequate preparation.

1. Executive Summary
2. project background and history
3. Demand and Market Study
4. Demand Projections
5. Forecasting Techniques
6. Export Projections
7. Market Penetration
8. Sensitivity Analysis
9. Sales forecast and Marketing
10. Production program
11. Plant Capacity
12. Materials and Inputs
13. Supply Program
14. Project Location
15. Plant Site within the location
16. Local Conditions
17. Layout and Physical Coverage of project
18. Technology and Equipment
19. Civil Engineering
20. Plant Organizations
21. Overhead Costs
22. Labor
23. Staff
24. Implementation Scheduling
25. Financial Evaluation
26. Economic Evaluation

Technical Feasibility :

1. Technology Considered and rationale for the ultimate choice of Technology

2. The cost of technology in terms of investment or lump sum payment of technology fees or royalty or annualized payments have to be determined and detailed.
3. Equipments have to be categorized as belonging to the production infrastructure or other categories the basis of their choice elaborated and their cost estimated with appropriate details of quantities and rates.

Economic and Commercial evaluation:

1. The nature of project should contribute to the national economy.
2. Raising of aggregate consumption could be one of the basic objectives in project evaluation.
3. Prepare comparative Return Analysis and defined return analysis
4. Estimate total investment
5. Direct Capital Investment
6. Offsite facilities and Supporting Utilities
7. transfer of existing Capital item, Preliminary Project engineering expenses, Working Capital Return on Investment
8. General Facilities

Project Risk Analysis

1. Identifying Critical Sources of Risk
2. Measuring the quantum of risk
3. Incorporating risk in decision making

Project Monitoring and Controlling Process

1. Monitoring the Progress of Project Activities
2. Monitoring Consumption of Resources
3. Revision/Updating Of A Project Schedule
4. Reallocate (Addition/Shifting) Resources Among Activities.

Feed forward Control and anticipate problems

Examples

- Pre-employment drug testing
- Inspect raw materials
- Hire only college graduates

Focus is on

Inputs

Concurrent Control Solve Problems as They Happen

Examples

- Adaptive culture
- Total quality management
- Employee self-control

Focus is on

Ongoing Processes

Feedback Control Solves Problems After They Occur

Examples

- Analyze sales per employee
- Final quality inspection
- Survey customers

Focus is on

Outputs

Three Types of Time Based Control

1. Establishes Standards to Prevent Problems
2. Measures Activities When Performed
3. Measures Final Activity

Control of Major Constraints

- Time
- Cost
- Quality
- Environmental
- HR management
- Risk management

Time Management

- Purpose: Create a realistic schedule with the team
- Identify the activities (tasks)
 - Activities are action steps (HOW) and different from deliverables that are tangible results (WHAT)
 - Use the WBS and scope statement
 - Develop activity lists and revise the WBS

- **Sequence activities**
 - Consider dependencies
- **Estimate durations (time)**
 - Top down, bottom up estimates, Monte Carlo simulations
 - Estimating formulae (PERT estimates)
 - Expert opinion
 - Consider resource capabilities
 - Look at similar projects
- **Develop the schedule (Gantt chart)**
 - Document assumptions and decisions
 - Use project management scheduling software e.g. MS Project
- **Control the schedule**
 - Performance reports, change requests, time management plan, corrective action, lessons learned
 - E.g. baseline Gantt chart and then update
 - Frequency
 - Roles and responsibilities
 - Control techniques e.g. meetings.

Cost Management

- Plan resources (people, equipment, materials)
 - Consider WBS, scope statement, organizational policies, staff pool
 - Identify resource requirements
- Cost centers at Your company?
 - Time is money
- Cost budgeting
 - Resource leveling
 - Cost baseline
- Control costs

- Performance reports, change requests, cost management plan, corrective action, lessons learned
 - e.g. budgeted, actual, variance (with explanation)

Cost Variance = ACWP-BCWP

- ACWP= Actual cost of work performed
- BCWP= Budgeted cost of work performed
- ECAC= Total Budget +Cost Variance.
- ECAC= Estimated cost at completion.

BUDGETARY CONTROL

- Cost Standards
- Master Budget
- Production Budgets
- Project Budgets
- Human Resources Budget
- Financial Ratios

Cash Budget

- Estimates and reports cash flow on a daily or weekly basis to ensure that the company has sufficient cash.

Capital Budget

- Lists planned investments in major assets.
- Not only have a large impact on future expenses, they are investments designed to enhance profits .

Quality

The totality of features and characteristics of a product or services which bear on its ability to satisfy a stated or implied need”

Objective:

To provide a formalized system within the project system which ensures that the needs of the customer or the stated objectives of the system are continually being met.

The process of implementing quality system

- Establishing the reason for wanting a system

- Train people and prepare for documentation
- Create documentation
- System for internal audit
- System for external audit

Quality Management

- Plan for quality
 - Quality product and quality project management practices
 - Quality standards
 - Conform to specifications (project produces what it said it would)
 - Fitness for use (satisfy needs)
 - Prevention vs. inspection
 - Plan, do, check, act
 - Benchmark, checklists, flow charts, cause/effect diagrams
- Quality management plan
 - Organizational structure, processes, resources, procedures, responsibilities to ensure quality plan is implemented
 - Quality metrics
 - Checklists
- Quality Assurance
 - Follow the quality management plan, audits, improvements
- Quality control
 - Process and product results
 - Control charts, Pareto diagrams, trend analysis

Quality Tips

- Start with a clear view of quality in mind
- What is quality?
- Implications for ALL knowledge areas

Total Quality Management (TQM)

- Commitment to infusing quality into every activity.
- Focuses on teamwork, increasing customer satisfaction, and lowering costs.
- Means a shift from a bureaucratic to a decentralized approach to control.
- Has a target of zero defects.

Most companies that have adopted TQM have incorporated.

- Quality
- Empowerment
- Benchmarking
- Outsourcing
- Standard for reduced cycle time
- Continuous improvement

Statistical Quality Control Steps

1. Define the characteristics of a high-quality output.
2. Breakdown work activities into separate elements required for producing a high-quality output.
3. Have current and reasonable standards.
4. Discuss specific performance expectations for every job with workers.
5. Make check sheets and collect data for each task.
6. Evaluate employee progress at frequent intervals.

Requirements of environmental systems

- Commitment
- Environmental policy
- Environmental review
- Authority and responsibility
- Maintaining of relevant records
- Objectives and goals
- Plan of action

Drafting a Detailed Project Report.

While drafting a Detailed Project Report following points are to be considered:

1. Product, Capacity and Applications
2. Market, Competition and Demand – Supply estimate
3. Production Process and Technical Arrangement
4. Plant and Machinery, Capacity and Cost, Equipments, the suppliers of machinery, price delivery.
5. Land and Building
6. Electricity, fuel, water and steam are required to produce at full capacity, cost to arrange for supply of these in the first instance and later for consuming these.
7. Project entail liquid effluent or air-pollution? What is the type of equipment to be installed and process to be carried out to cope with the problem?
8. Location
9. Raw material, Working Capital, Manpower
10. Project Cost, Financial Incentives
11. What re the various sources from which money will be raised to meet the project cost? How much money will be raised from each source?
12. Capacity Utilization, Income Expenditure and Profitability Projection.
13. Cash flow Projection, Debt Service.
14. What is the break-even level of operation –level at which enterprise will make neither profit nor loss?
15. What will happen to profitability if some critical assumptions do not come true?
16. What will be a realistic time schedule for carrying out individual tasks pertaining to project-implementation (setting up of enterprise)?
17. What will be the total time frame for implementation?
18. What are the important statutory formalities, which the enterprise must fulfill prior to commencement of production?
19. What are the major factors, which will determine the enterprise performance?
20. What are the requirements of information to establish implement commission and run the project? Where are they available? How are you going to manage these inputs of information?

Guidelines for micro/mini/small hydro electric power projects

Component of the Project

The nature of projects can be reservoir, run of river or canal based. The projects can be divided in two parts civil and Electrical. The civil projects include various activities such as construction of Dam/Diversion weir, reservoir, and power channel. In-take tank, feeder channel, Fore bay Spillways, Pen Stroke and Tail race channel etc. Electrical Components covers turbine, Alternate controls, Transformation, Evaluation of Power etc.

Project Design

A small Hydro Power generating project design is based on availability of hydro potential and sufficient head to utilize potential energy which is used to generate electricity.

Design criteria further requires survey and investigation for selection of Land /site on topographical /geological and Hydrological grounds.

Details required for Mini/Micro/Small Power Generation projects.

1. Brief proposal indicating type of plant, availability of rate of flow of water and head i.e. Run off river based or stored water type.
2. Availability of Land
3. Environmental and Rehabilitation Constraints, if any
4. Economics of Power generation
5. Peak Load existing and in Horizon Year
6. Connected Load
7. Demand Factor
8. Load Factor
9. Utilization Factor
10. Plant Factor
11. Whether proposed plant is of base load plant or stand by reserved plant
12. Proximity of load
13. Generation Voltage and Frequency
14. Transmission/distribution voltage and frequency
15. Specifications of equipments
16. Selection of Type and Turbine and alternator/with techno –commercial reasons
17. Tariff Calculations and Market (consumers)
18. Present Tariff Structure and expected increase in horizon year

The Broad Guidelines for Power Projects are provided by NABARD.

SUMMARY

Project Planning in general can best be described as the function of selecting the enterprise objectives and establishing the policies, procedures and programs necessary for achieving them. Characteristics of Project Planning are: project planning must be systematic, flexible, enough to handle unique activities, disciplined through reviews and controls and capable of accepting multifunctional inputs; task is required to be well understood prior to being performed, much of the work can be preplanned; during the actual task execution more knowledge is learned that in turn leads to changes in resources allocations schedules and priorities. PERT is the technique based on the assumption that an activity's duration follows a probability distribution instead of being a single value, the probabilistic information about the activities is translated into probabilistic information about the project, and three time estimates are required to compute the parameters of an activity's duration distribution:

FOR DISCUSSION

1. What is project planning?
2. What are the characteristics of project planning?
3. Explain briefly about CPM.
4. What is PERT?
5. What are the differences between CPM and PERT?
6. Draft A project Report.

SUGGESTED BOOK READINGS

1. James P. Lewis, (2002), “Fundamentals of Project Management: developing core competencies to help outperform the competition”, AMACOM Division, American Management Association, USA.
2. Trevor Leonard Young, (2003), “The Handbook of Project Management: A Practical Guide to Effective Policies and Procedures”, Kogan Page, USA.
3. Lauren Keller Johnson and Richard Luecke, (2006), “The Essentials of Project Management”, Harvard Business School Press, USA.
4. P Gopalkrishnan and VE Rama Moorthy (1993). “Text Book of Project Management.” Macmillan India Limited.Delhi.
5. Arun Kumar, Mp Sharma, Deepak Mathur (2003)Small Hydro Power : Initiatives and Private Sector Participation. 3rd Edition. Publication by AHEC,IIT Roorkee.Roorkee.