



NEHRU COLLEGE OF ENGINEERING AND RESEARCH CENTRE
(NAAC Accredited)
(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)



DEPARTMENT OF MECHATRONICS ENGINEERING

COURSE MATERIALS



HS 300 PRINCIPLES OF MANAGEMENT

VISION OF THE INSTITUTION

To mould true citizens who are millennium leaders and catalysts of change through excellence in education.

MISSION OF THE INSTITUTION

NCERC is committed to transform itself into a center of excellence in Learning and Research in Engineering and Frontier Technology and to impart quality education to mould technically competent citizens with moral integrity, social commitment and ethical values.

We intend to facilitate our students to assimilate the latest technological know-how and to imbibe discipline, culture and spiritually, and to mould them in to technological giants, dedicated research scientists and intellectual leaders of the country who can spread the beams of light and happiness among the poor and the underprivileged.

ABOUT DEPARTMENT

- ◆ Established in: 2013
- ◆ Course offered: B.Tech Mechatronics Engineering
- ◆ Approved by AICTE New Delhi and Accredited by NAAC
- ◆ Affiliated to the University of Dr. A P J Abdul Kalam Technological University.

DEPARTMENT VISION

To develop professionally ethical and socially responsible Mechatronics engineers to serve the humanity through quality professional education.

DEPARTMENT MISSION

- 1) The department is committed to impart the right blend of knowledge and quality education to create professionally ethical and socially responsible graduates.
- 2) The department is committed to impart the awareness to meet the current challenges in technology.
- 3) Establish state-of-the-art laboratories to promote practical knowledge of mechatronics to meet the needs of the society

PROGRAMME EDUCATIONAL OBJECTIVES

- I. Graduates shall have the ability to work in multidisciplinary environment with good professional and commitment.
- II. Graduates shall have the ability to solve the complex engineering problems by applying electrical, mechanical, electronics and computer knowledge and engage in lifelong learning in their profession.
- III. Graduates shall have the ability to lead and contribute in a team with entrepreneur skills, professional, social and ethical responsibilities.
- IV. Graduates shall have ability to acquire scientific and engineering fundamentals necessary for higher studies and research.

PROGRAM OUTCOME (PO'S)

Engineering Graduates will be able to:

PO 1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO 3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO 4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO 6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO 8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOME(PSO'S)

PSO 1: Design and develop Mechatronics systems to solve the complex engineering problem by integrating electronics, mechanical and control systems.

PSO 2: Apply the engineering knowledge to conduct investigations of complex engineering problem related to instrumentation, control, automation, robotics and provide solutions.

COURSE OUTCOME

After the completion of the course the student will be able to

C315.1	Acquire ability to manage people in the organization.
C315.2	Identify various management theories and practices
C315.3	Describe about the planning process for organizations
C315.4	Develop decisions for organization by identifying the limitatons.
C315.5	Interpret about staffing and related HRD functions
C315.6	Understand the knowledge about leadership and controlling.

CO VS PO'S AND PSO'S MAPPING

CO	PO1	PO 2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS0 1	PSO 2
C315.1	-	-	2	-	-	3	1	3	3	1	3	2	-	-
C315.2	-	-	2	-	-	3	1	3	-	1	3	2	-	-
C315.3	-	-	2	-	-	3	1	3	3	1	3	2	-	-
C315.4	-	-	2	-	-	3	1	3	-	1	3	2	-	-
C315.5	-	-	2	-	-	3	1	3	2	1	3	2	-	-
C315.6	-	-	2	-	-	3	1	3	3	1	3	2	-	-

Note: H-Highly correlated=3, M-Medium correlated=2, L-Less correlated=1

SYLLABUS

Course code	Course Name	L-T-P - Credits	Year of Introduction
HS300	Principles of Management	3-0-0-3	2016
Prerequisite : Nil			
Course Objectives			
<ul style="list-style-type: none"> • To develop ability to critically analyse and evaluate a variety of management practices in the contemporary context; • To understand and apply a variety of management and organisational theories in practice; • To be able to mirror existing practices or to generate their own innovative management competencies, required for today's complex and global workplace; • To be able to critically reflect on ethical theories and social responsibility ideologies to create sustainable organisations. 			
Syllabus			
Definition, roles and functions of a manager, management and its science and art perspectives, management challenges and the concepts like, competitive advantage, entrepreneurship and innovation. Early contributors and their contributions to the field of management. Corporate Social Responsibility. Planning, Organizing, Staffing and HRD functions, Leading and Controlling. Decision making under certainty, uncertainty and risk, creative process and innovation involved in decision making.			
Expected outcome.			
A student who has undergone this course would be able to <ol style="list-style-type: none"> i. manage people and organisations ii. critically analyse and evaluate management theories and practices iii. plan and make decisions for organisations iv. do staffing and related HRD functions 			
Text Book:			
Harold Koontz and Heinz Weihrich, <i>Essentials of Management</i> , McGraw Hill Companies, 10th Edition.			
References:			
<ol style="list-style-type: none"> 1. Daft, <i>New era Management</i>, 11th Edition, Cengage Learning 2. Griffin, <i>Management Principles and Applications</i>, 10th Edition, Cengage Learning 3. Heinz Weirich, Mark V Cannice and Harold Koontz, <i>Management: a Global, Innovative and Entrepreneurial Perspective</i>, McGraw Hill Education, 14th Edition 4. Peter F Drucker, <i>The Practice of Management</i>, McGraw Hill, New York 5. Robbins and Coulter, <i>Management</i>, 13th Edition, 2016, Pearson Education 			
Course Plan			
Module	Contents	Hours	Sem. Exam Marks
I	Introduction to Management: definitions, managerial roles and functions; Science or Art perspectives- External environment- global, innovative and entrepreneurial perspectives of Management (3 Hrs.)– Managing people and organizations in the context of New Era- Managing for competitive advantage - the Challenges of Management (3 Hrs.)	6	15%

II	Early Contributions and Ethics in Management: Scientific Management- contributions of Taylor, Gilbreths, Human Relations approach-contributions of Mayo, McGregor's Theory, Ouchi's Theory Z (3 Hrs.) Systems Approach, the Contingency Approach, the Mckinsey 7-S Framework Corporate Social responsibility- Managerial Ethics. (3 Hrs)	6	15%
FIRST INTERNAL EXAMINATION			
III	Planning: Nature and importance of planning, -types of plans (3 Hrs.)- Steps in planning, Levels of planning - The Planning Process. – MBO (3 Hrs.).	6	15%
IV	Organising for decision making: Nature of organizing, organization levels and span of control in management Organisational design and structure –departmentation, line and staff concepts (3 Hrs.) Limitations of decision making- Evaluation and selecting from alternatives- programmed and non programmed decisions - decision under certainty, uncertainty and risk-creative process and innovation (3 Hrs.)	6	15%
SECOND INTERNAL EXAMINATION			
V	Staffing and related HRD Functions: definition, Empowerment, staff – delegation, decentralization and recentralisation of authority – Effective Organizing and culture-responsive organizations –Global and entrepreneurial organizing (3 Hrs.) Manager inventory chart-matching person with the job-system approach to selection (3 Hrs.) Job design-skills and personal characteristics needed in managers-selection process, techniques and instruments (3 Hrs.)	9	20%
VI	Leading and Controlling: Leading Vs Managing – Trait approach and Contingency approaches to leadership - Dimensions of Leadership (3 Hrs.) - Leadership Behavior and styles – Transactional and Transformational Leadership (3 Hrs.) Basic control process- control as a feedback system – Feed Forward Control – Requirements for effective control – control techniques – Overall controls and preventive controls – Global controlling (3 Hrs.)	9	20%
END SEMESTER EXAM			

Question Paper Pattern

Max. marks: 100, Time: 3 hours .

The question paper shall consist of three parts

Part A: 4 questions uniformly covering modules I and II. Each question carries 10 marks

Students will have to answer any three questions out of 4 (3X10 marks =30 marks)

Part B : 4 questions uniformly covering modules III and IV. Each question carries 10 marks

Students will have to answer any three questions out of 4 (3X10 marks =30 marks)

Part C: 6 questions uniformly covering modules V and VI. Each question carries 10 marks

Students will have to answer any four questions out of 6 (4X10 marks =40 marks)

Note: In all parts, each question can have a maximum of four sub questions, if needed.

QUESTION BANK

MODULE I			
Q:NO:	QUESTIONS	CO	KL
1	a) Define management. b) Explain the five managerial functions.	CO1	K2
2	a) What are the different levels of Management? b) Explain the Macro and Micro environmental factors.	CO1	K1
3	a) List and elaborate five important roles of a manager b) With suitable examples, illustrate the Planning, Organizing, Staffing, Leading and Controlling functions of management	CO1	K2
4	a) F.W.Taylor contributed some principles of scientific management. Identify the principles and explain briefly. b) Explanation about Need for management	CO1	K2
5	a) Define management. b) Why management is called an art and science? c) In the context of a car manufacturing firm, describe any four elements of the external environment.	CO1	K2
6	a) Is management a science or art or both? b) How do you view management in global, innovative and entrepreneurial perspective?	CO1	K5
7	List and Explain Managerial roles.	CO1	K5

8	<p>a) List any four forces of the external environment</p> <p>b) Why the management of the organizations of the new era differ from old ones?</p> <p>c) “New generation managers are multi skill experts” What do you mean by this?</p>	CO1	K5	
9	<p>a) What are the challenges a global manager face in modern industries? Discuss briefly.</p> <p>b) Write any two points favour of management as a science and as an art.</p>	CO1	K2	
10	<p>a) What is meant by competitive advantage?</p> <p>b) List any four important features of the organizations of the new era.</p> <p>c) What challenges are faced by the new generation firms?</p>	CO1	K1	
MODULE II				
1	<p>a) Define scientific management.</p> <p>b) Explain any four techniques in scientific management.</p>	CO2	K2	
2	<p>a) Explain Ouchi’s theory Z by differentiating between American and Japanese management.</p> <p>b) Explain the postulates of Ouchi’s theory and comment on its application in Indian conditions.</p>	CO2	K1	
3	<p>a) Explain Ouchi’s Z theory 5</p> <p>b) Explain McGregor’s X and Y theory.</p>	CO2	K1	
4	<p>a) What is Mckinsey’s 7-s frame work? 6</p> <p>b) Explain the systems approach in management.</p>	CO2	K2	
5	<p>a) Describe the philosophy of Scientific Management”</p>	CO2	K2	

	b) List and illustrate the contributions of Gilbreth's			
6	a) What is managerial ethics? Illustrate a situation in which whistle blowers perform ethical duty b) Explain the Mc Kinsey 7S Framework	CO2	K3	
7	a) Write a note on workforce diversity. b)What are the four fundamental success drivers? Write about quality and speed with examples.	CO2	K2	
8	a)Discuss the advantages and Limitations of system approach. b)Differentiate contingency approach from system approach	CO2	K2	
9	a) List any four important contributions by FW Taylor. b) Why Elton Mayo's studies is called human relations management? c) State Douglas Mc Gregor's Theory X and Theory Y	CO2	K2	
10	a) Distinguish between system approach and contingency approach. b) Draw 7S Framework. c) Describe any one instance of application of Corporate Social Responsibility.	CO2	K1	
MODULE III				
1	Explain the various steps involved in planning process.	CO3	K2	
2	a) Define planning and discuss levels of planning. b) Why planning and controlling are said to be inseparable- the Siamese twins of management.	CO3	K1	
3	What is MBO? How is it different from conventional planning process?	CO3	K5	
4	Explain the types of Plans with examples.	CO3	K5	

5	a) Define the terms: Plan, Objective, Goal, Policy and Rule b) Differentiate between Strategic, Administrative and Routine type planning	CO3	K5	
6	a) Describe the stages involved in the planning process b) With a block diagram, outline the structure of Management by Objectives MBO	CO3	K5	
7	a) Discuss in detail about narrow span of management b) Discuss in detail about wide span of management.	CO3	K4	
8	a) Discuss the steps identified on describing a creative process. b) Define planning premises.	CO3	K4	
9	a) List any four objectives of planning b) Who require strategic planning? Why? c) Distinguish between plan, goal and procedure.	CO3	K2	
10	a) List the steps of the planning process adopted in a production firm. b) Why the planning of lower level managers is considered easier? c) List the advantages of Management by objectives.	CO3	K2	
MODULE IV				
1	a) Define organizing. b) Explain organisation levels in terms of narrow and wide spans with sketches and discuss its merits and demerits.	CO4	K2	
2	(a) What is meant by decision making and rationality in decision making. (b) Explain the three approaches to select an alternative in decision making such as experience, experimentation, research and	CO4	K6	

	analysis.			
3	a) What is the importance of span of control in management? b) Explain the line and staff approach in management.	CO4	K2	
4	a) What is meant by the term Departmentation? b) Explain the strategies adopted in Departmentation process with example.	CO4	K1	
5	a) Distinguish between line and staff functions with the aid of examples b) Define the term – Span of Control c) What is an organization chart? What are its merits and demerits?	CO4	K5	
6	a) Illustrate the difference between programmed and non programmed decisions by highlighting suitable examples b) Describe the following stages in creative process: Unconscious scanning, Intuition, developing insights and logical evaluation	CO4	K2	
7	a) Explain the nature and purpose of organisation b) Define MBO in planning.	CO4	K4	
8	Explain the concept of functional authority.	CO4	K2	
9	a) Define span of control. (2) b) Classify the factors affecting the span of control. c) What is meant by departmentation?	CO4	K2	
10	a) List the merits and demerits of line organization structure (three each) b) Why decision making is a difficult task? (four reasons)	CO4	K2	

	c) List any two methods to deal with decision making under uncertainty.			
MODULE V				
1	What is meant by staffing? Discuss the systems approach to staffing.	CO5	K4	
2	Define delegation of authority and discuss advantages of delegation.	CO5	K5	
3	a) What is the significance of organisational culture in management? b) What are the sources of organisational culture? Explain them.	CO5	K6	
4	Explain the process of Job Analysis	CO5	K2	
5	a) Why empowerment is needed? b) Define delegation. Is it possible to delegate authority and responsibility? Why? c) What is recentralization of authority?	CO5	K6	
6	a) What is a manager inventory chart? b) Distinguish the following: Recruitment, Selection, Placement and Induction c) List the advantages and limitations of interview as a selection technique	CO5	K6	
7	a) Discuss in detail about the delegation of authority. b) Differentiate between leader and manager.	CO5	K6	
8	a) Write down the advantages and disadvantages of manager inventory chart b) Specify the goals of global organising	CO5	K6	

MODULE VI

1	a) Define controlling. b) Differentiate and discuss feedforward and feedback control systems.	CO6	K5
2	a) Name and explain any four control techniques. b) Explain the principle of preventive control and also discuss its assumptions and advantages.	CO6	K6
3	Differentiate Transactional and Transformational leadership.	CO3	K3
4	a) Explain Managerial Grid with suitable example. b) Explain the basic Control process.	CO6	K2
5	a) Describe transactional and transformational leadership styles b) Illustrate how power and authority are utilized by an effective leader	CO6	K6
6	a) Define controlling and illustrate conventional feedback control mechanism b) With a block diagram and highlighting a situation, explain how a feed forward control mechanism works	CO6	K6
7	a) What are the requirements for effective control b) What are the characteristics of control?	CO6	K6
8	Classify the various budgets and compare them	CO6	K2
9	a) Describe any two types of leadership styles. b) List six important qualities of a leader.	CO6	K2
10	a) Explain the process of controlling function with the aid of a sketch.	CO6	K1

	b) Distinguish between feed back and feed forward control mechanisms.			
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APPENDIX 1	
CONTENT BEYOND THE SYLLABUS	
S:NO	TOPIC
1	BRAIN STORMING TECHNIQUE
2	CREATIVITY AND INNOVATION

**HS 300 – PRINCIPLES OF
MANAGEMENT**

**(As per syllabus of APJ Abdul Kalam
Technological University)**

SYLLABUS

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TEXT BOOKS AND REFERENCE BOOKS

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QUESTION PAPER PATTERN

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MODULE 1

INTRODUCTION TO MANAGEMENT

CHAPTER 1 - INTRODUCTION TO MANAGEMENT

Who are Managers and where do they work?

There's no prototype or pattern as to who can be managers. Managers can be under the age of 18 to over age 80. They run large corporations as well as entrepreneurial start-ups. They're found in government departments, hospitals, small businesses, not-for-profit agencies, museums, schools, and even such nontraditional organizations as political campaigns and music tours. Managers can also be found doing managerial work in every country on the globe. In addition, some managers are top-level managers while others are first-line managers. And today, managers are just as likely to be women as they are men.

However all managers share one common element. They work in an organization setting.

What is an organization?

It's a deliberate arrangement of people to accomplish some specific purpose. Your college or university is an organization; so are, government departments, Facebook, your neighborhood grocery store, and global companies like Nestle, Nokia etc. All are considered organizations and have three common characteristics.

First, an organization has a distinct purpose. This purpose is typically expressed through goals that the organization hopes to accomplish. Second, each organization is composed of people. It takes people to perform the work that's necessary for the organization to achieve its goals. Third, all organizations develop some deliberate structure within which members do their work.



What do managers do?

Management is finding one best way to do a job. Eg FW Taylor used his theory of scientific management to find one best way of doing a job.

What is Management?

Management is the process of getting things done, effectively and efficiently, with and through other people. Management of an organization is the process of establishing objectives and goals of the organization periodically, designing the work system and the organization

structure, and maintaining an environment in which individuals, working together in groups, accomplish their aims and objectives and goals of the organization effectively and efficiently

Efficiency refers to getting the most output from the least amount of inputs. Because managers deal with scarce inputs—including resources such as people, money, and equipment—they're concerned with the efficient use of those resources. It's often referred to as “doing things right”—that is, not wasting resources.

It's not enough, however, just to be efficient. Management is also concerned with being effective, completing activities so that organizational goals are attained.

Effectiveness is often described as “doing the right things”—that is, doing those work activities that will help the organization reach its goals.



Mintzberg's Managerial Roles

The term **managerial roles** refers to specific actions or behaviors expected of and exhibited by a manager. (Think of the different roles you play—such as student, employee, student organization member, volunteer, sibling, and so forth—and the different things you're expected to do in these roles.) When describing what managers do from a roles perspective, we're not looking at a specific person per se, but at the expectations and responsibilities that are associated with being the person in that role—the role of a manager.

The **interpersonal roles** are ones that involve people (subordinates and persons outside the organization) and other duties that are ceremonial and symbolic in nature. The three interpersonal roles include figurehead, leader, and liaison. The **informational roles** involve collecting, receiving, and disseminating information. The three informational roles include monitor, disseminator, and spokesperson. Finally, the **decisional roles** entail making decisions or choices. The four decisional roles include entrepreneur, disturbance handler, resource allocator, and negotiator.

Interpersonal Roles

- Figurehead
- Leader
- Liaison



Informational Roles

- Monitor
- Disseminator
- Spokesperson



Decisional Roles

- Entrepreneur
- Disturbance handler
- Resource allocator
- Negotiator



a) Interpersonal Roles

The ones that, like the name suggests, involve people and other ceremonial duties. It can be further classified as follows

- Leader – Responsible for staffing, training, and associated duties.
- Figurehead – The symbolic head of the organization.
- Liaison – Maintains the communication between all contacts and informers that compose the organizational network.

b) Informational Roles

Related to collecting, receiving, and disseminating information.

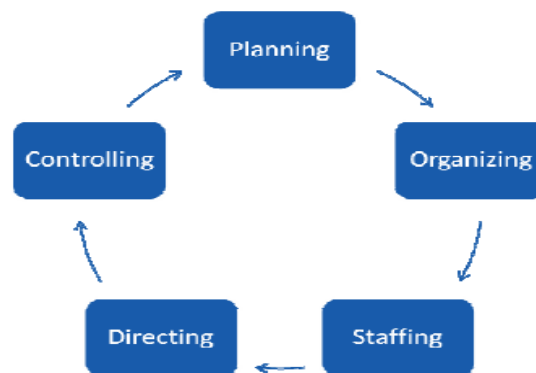
- Monitor – Personally seek and receive information, to be able to understand the organization.
- Disseminator – Transmits all important information received from outsiders to the members of the organization.
- Spokesperson – On the contrary to the above role, here the manager transmits the organization's plans, policies and actions to outsiders.

c) Decisional Roles

Roles that revolve around making choices.

- Entrepreneur – Seeks opportunities. Basically they search for change, respond to it, and exploit it.
- Negotiator – Represents the organization at major negotiations.
- Resource Allocator – Makes or approves all significant decisions related to the allocation of resources.
- Disturbance Handler – Responsible for corrective action when the organization faces disturbances.

Functions of Management



1. Planning

It is the basic function of management. It deals with chalking out a future course of action & deciding in advance the most appropriate course of actions for achievement of pre-determined goals. According to KOONTZ, “Planning is deciding in advance – what to do, when to do & how to do. It bridges the gap from where we are & where we want to be”. A plan is a future course of actions. It is an exercise in problem solving & decision making. Planning is determination of courses of action to achieve desired goals. Thus, planning is a systematic thinking about ways & means for accomplishment of predetermined goals.

2. Organizing

It is the process of bringing together physical, financial and human resources and developing productive relationship amongst them for achievement of organizational goals. According to Henry Fayol, “To organize a business is to provide it with everything useful or its functioning i.e. raw material, tools, capital and personnel’s”. To organize a business involves determining & providing human and non-human resources to the organizational structure. Organizing as a process involves:

- Identification of activities.
- Classification of grouping of activities.
- Assignment of duties.
- Delegation of authority and creation of responsibility.
- Coordinating authority and responsibility relationships.

3. Staffing

It is the function of manning the organization structure and keeping it manned. Staffing has assumed greater importance in the recent years due to advancement of technology, increase in size of business, complexity of human behavior etc.

According to Kootz & O’Donell, “Managerial function of staffing involves manning the organization structure through proper and effective selection, appraisal & development of personnel to fill the roles designed un the structure”. Staffing involves:

- Manpower Planning (estimating man power in terms of searching, choose the person and giving the right place).
- Recruitment, selection & placement.
- Training & development.
- Remuneration.
- Performance appr8aisal.
- Promotions & transfer.

4. Directing

It is that part of managerial function which actuates the organizational methods to work efficiently for achievement of organizational purposes. It is considered life-spark of the enterprise which sets it in motion the action of people because planning, organizing and staffing are the mere preparations for doing the work. Direction is that inert-personnel aspect of management which deals directly with influencing, guiding, supervising, motivating sub-ordinate for the achievement of organizational goals. Direction has following elements:

- Supervision
- Motivation
- Leadership
- Communication

(i) Supervision- implies overseeing the work of subordinates by their superiors. It is the act of watching & directing work & workers.

(ii) Motivation- means inspiring, stimulating or encouraging the sub-ordinates with zeal to work. Positive, negative, monetary, non-monetary incentives may be used for this purpose.

(iii) Leadership- may be defined as a process by which manager guides and influences the work of subordinates in desired direction.

(iv) Communications- is the process of passing information, experience, opinion etc from one person to another. It is a bridge of understanding.

5. Controlling

It implies measurement of accomplishment against the standards and correction of deviation if any to ensure achievement of organizational goals. The purpose of controlling is to ensure that everything occurs in conformities with the standards. An efficient system of control helps to predict deviations before they actually occur.

Controlling is the process of checking whether or not proper progress is being made towards the objectives and goals and acting if necessary, to correct any deviation

Therefore controlling has following steps:

- (i) Establishment of standard performance.
- (ii) Measurement of actual performance.
- (iii) Comparison of actual performance with the standards and finding out deviation if any.
- (iv) Corrective action.

Nature of Management

Science or an art?

Managing like all other practices- whether medicine, music composition, engineering, accountancy- is an art. It is a know-how. It is doing things in the light of realities of a situation. Yet managers can work better by using the organised knowledge of management. It is this knowledge that constitutes a science. Thus managing as practice is an art; the organised knowledge underlying the practice may be referred to as science.

Levels of Management

Considering the hierarchy of authority and responsibility, one can identify three levels of management namely:

(i) **Top management** of a company consists of owners/shareholders, Board of Directors, its Chairman, Managing Director, or the Chief Executive, or the General Manager or Executive Committee having key officers.

Top management is the ultimate source of authority and it lays down goals, policies and plans for the enterprise. It devotes more time on planning and coordinating functions. It is accountable to the owners of the business of the overall management. It is also described as the policy making group responsible for the overall direction and success of all company activities

(ii) **Middle management** of a company consists of heads of functional departments viz. Purchase Manager, Production Manager, Marketing Manager, Financial controller, etc. and Divisional and Sectional Officers working under these Functional Heads.

The job of middle management is to implement the policies and plans framed by the top management. It serves as an essential link between the top management and the lower level or operative management. They are responsible to the top management for the functioning of their departments.

(iii) **Lower level or operative management** of a company consists of Superintendents, Foremen, Supervisors, etc.

It is placed at the bottom of the hierarchy of management, and actual operations are the responsibility of this level of management. It consists of foreman, supervisors, sales officers, accounts officers and so on. They are in direct touch with the rank and file or workers. Their authority and responsibility is limited. They pass on the instructions of the middle management to workers.

Managerial Skills

A skill is an individual's ability to translate knowledge into action. In order to be able to successfully discharge his roles, a manager should possess four major skills. These are conceptual skill, human relations skill, technical skill and design skill.

Conceptual skill deals with ideas. The conceptual skill refers to the ability of a manager to take a broad and farsighted view of the organization and its future, his ability to think in abstract, his ability to analyze the forces working in a situation, his creative and innovative ability and his ability to assess the environment and the changes taking place in it.

The technical skill is the manager's understanding of the nature of job that people under him have to perform. It refers to a person's knowledge and proficiency in any type of process or technique. In a production department this would mean an understanding of the technicalities of the process of production.

Human relations skill is the ability to interact effectively with people at all levels. This skill develops in the manager sufficient ability (a) to recognize the feelings and sentiments of others; (b) to judge the possible actions to, and outcomes of various courses of action he may undertake; and (c) to examine his own concepts and values which may enable him to develop more useful attitudes about himself.

Design Skill involves the ability to solve problems of the organisation. Top and middle level managements must have the ability to see more than a problem. They must have in addition the skill of a good design engineering working out a practical solution to the problem. Managers must be able to develop a workable solution to the problem.

CHAPTER 2 – MANAGING PEOPLE AND ORGANISATIONS IN THE NEW ERA

External Environment

The external business environment of a firm can be classified in to micro and macro environment.

Micro Environment

The micro environment or task environment encompasses those forces in the close surrounding area of an organization that influence it's functioning. Even if it is external to an organization, micro factors need not affect all the firms in a particular industry in an equivalent manner. Some of the micro factors may be unique to a firm. It embraces the following factors:

1. Suppliers

Suppliers of raw materials, components and semi finished goods are very prominent for a firm. They operate as an important force within the micro environment of the firm.

2. Marketing intermediaries

It includes the firms that assist the company in promoting, selling and distributing its goods to final buyers. They are operating in the micro environment.

3. Customers

As far as any business firm is concerned, creation and maintenance of customers are of utmost importance. Triumph of a business principally depends on realising the needs, desire and tastes of customers.

4. Competitors

Every organization has a competitive environment. Activities of a business should be adjusted according to the actions and reactions of competitors. An enterprise will be facing direct and indirect competition from many rivalries. A firm should monitor the activities of the competitors in its micro environment and should counteract accordingly.

5. Public

Public refers to any cluster that has actual or potential interest in the business activities. Such clusters can exert influence on the business. *e.g.*, growth of consumer groups may affect the working of newly developed businesses.

6. Financiers

The term financiers include commercial banks, money lending institutions, private persons etc who have lent money for business operations. In addition to the financing capabilities, their policies and strategies, attitudes, ability to provide non-financial assistance etc are vital.

Macro Environment

A company along with its micro environment situate in a bigger macro environment. This micro environment provides opportunities and poses threats to a firm. The macro forces are generally more uncontrollable and the success of a company depends on its adaptability to the environment. A firm cannot exercise effective control on the factors of macro environment and only the degree of adaptability it has to that particular environment can direct it to success.

The macro environment of a firm consists of the following:

1. Economic environment

The Economic environment includes broad factors like structure and nature of the economy, the stage of development of the economy, economic resources, the level of income of the economy, the distribution of income and assets among citizens, linkages with global economy, economic policies etc. Important economic factors are:

- a) Degree of economic development.
- b) Structure of the economy.
- c) Economic policies.
- d) Economic conditions

2. Political Environment

It primarily comprises of the country's government's actions which may influence the operations of a company or business. These actions can be on different levels like local, regional, national or international. The decision makers should observe the movements of the government keenly, so that they can make quick decisions.

3. Technological environment

Along with determining the destiny of an organization, technology can contribute to the economic and social development of a nation. Factors like the type of technology in use, the level of technological developments, the speed with which new technologies are adopted and diffused, the type of technologies that are appropriate, the technology policy etc has deep implications on the prospects of the business.

4. Social Environment

The social environment of business includes social factors like customs, traditions, values, beliefs, poverty, literacy, life expectancy rate etc. The social structure and the values that a society cherishes have a considerable influence on the functioning of business firms. For example, during festive seasons there is an increase in the demand for new clothes, sweets, fruits, flower, etc.

5. Cultural environment

Culture of a particular region includes activities such as dance, drama, music and festivals. In its exact sense culture is understood as that composite whole which includes knowledge, belief, art, morals, law, customs and other capabilities and habits acquired by individual as a member of a society.

What Factors are Reshaping and Redefining Management?

In today's world, managers are dealing with changing workplaces, a changing workforce, global economic and political uncertainties and changing technology.

Importance of Customers to the Manager's Job

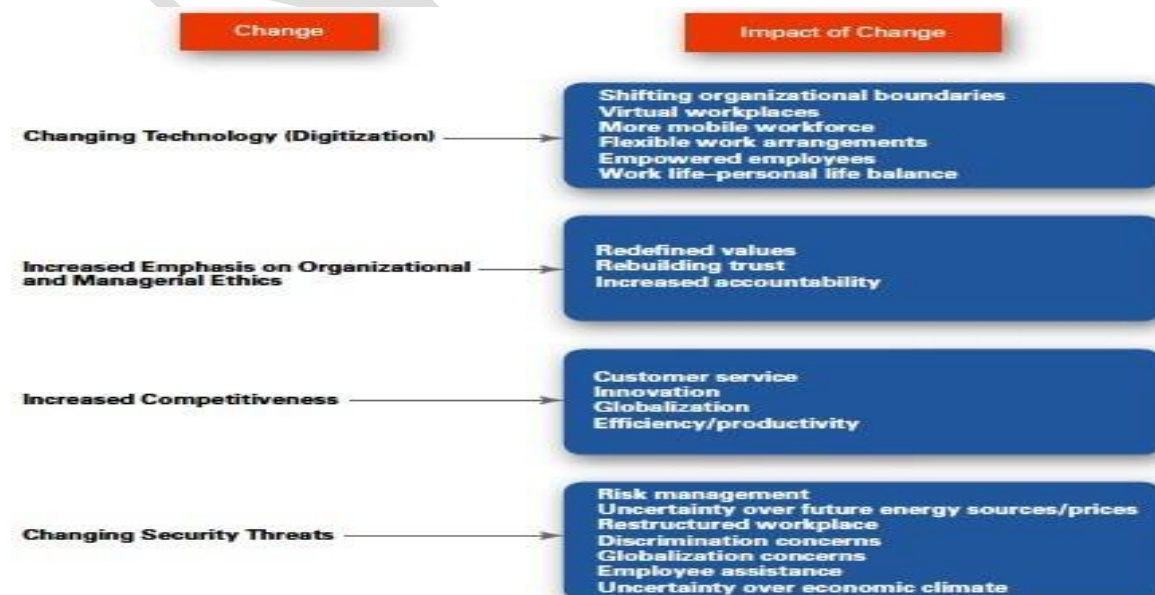
Managers are recognizing that delivering consistent high-quality customer service is essential for survival and success in today's competitive environment and that employees are an important part of that equation. The implication is clear—managers must create a customer-responsive organization where employees are friendly and courteous, accessible, knowledgeable, prompt in responding to customer needs, and willing to do what's necessary to please the customer.

Importance of Innovation to the Manager's Job

"Nothing is more risky than not innovating." Innovation means doing things differently, exploring new territory, and taking risks. And innovation isn't just for high-tech or other technologically sophisticated organizations. Innovative efforts can be found in all types of organizations. For example, at Tata of India, the company's top manager, chairman Ratan Tata, told his employees during the bleak aspects of the global economic downturn to "Cut costs. Think out of the box. Even if the world around you is collapsing, be bold, be daring, think big." And his employees obviously got the message. The company's introduction of the Rs 1 Lakh minicar, the Nano, was the talk of the global automotive industry. As these stories illustrate, innovation is critical.

Importance of Sustainability to the Manager's Job

From a business perspective, **sustainability** has been defined as a company's ability to achieve its business goals and increase long-term shareholder value by integrating economic, environmental, and social opportunities into its business strategies. Sustainability issues are now moving up the agenda of business leaders and the boards of thousands of companies. Like the managers at Walmart are discovering, running an organization in a more sustainable way will mean that managers have to make informed business decisions based on thorough communication with various stakeholders, understanding their requirements, and starting to factor economic, environmental, and social aspects into how they pursue their business goals.



Rewards and Challenges of Being a Manager

Rewards	Challenges
<ul style="list-style-type: none">• Create a work environment in which organizational members can work to the best of their ability• Have opportunities to think creatively and use imagination• Help others find meaning and fulfillment in work• Support, coach, and nurture others• Work with a variety of people• Receive recognition and status in organization and community• Play a role in influencing organizational outcomes• Receive appropriate compensation in the form of salaries, bonuses, and stock options• Good managers are needed by organizations	<ul style="list-style-type: none">• Do hard work• May have duties that are more clerical than managerial• Have to deal with a variety of personalities• Often have to make do with limited resources• Motivate workers in chaotic and uncertain situations• Blend knowledge, skills, ambitions, and experiences of a diverse work group• Success depends on others' work performance

Challenges of Management

1. Globalisation- When a global disaster strikes a country, the fragility of the global supply chain becomes more apparent. An important issue that managers have to deal with is globalization. Managers have to see through others eyes. All counties have different values, morals, customs, political and economic systems. All this has to be considered by a manager.
2. Expectations from the society – Society expects managers to be responsible and ethical. Managers have to go beyond profit making, including voluntary activities and concern for the broader social system.
3. Ethical behaviour – Managers want to be seen as ethical. Whether a manager acts ethically or unethically depends on his morality, values, personality etc. Code of ethics are popular tools for attempting to reduce employee ambiguity about what's ethical and what's not
4. Workplace diversity – Diversities in workplace exist in terms of age, gender, race, ability/disability, religion etc. Managers have to respond to the changing workforce.
5. Change in technology – A manager is required to be updated with all forms of technology and make appropriate investments in acquisition of manufacturing equipments.

MODULE 2

**EARLY CONTRIBUTIONS AND ETHICS IN
MANAGEMENT**

CHAPTER 1 – EVOLUTION OF MANAGEMENT THEORY

Management has been practiced a long time now. Organised endeavors directed by people responsible for planning, organizing, leading and controlling activities have existed for thousands of years.

The Egyptian pyramids and the Great Wall of China are proof that projects of tremendous scope, employing tens of thousands of people, were completed in ancient times. It took more than 100,000 workers some 20 years to construct a single pyramid. Who told each worker what to do? Who ensured that there would be enough stones at the site to keep workers busy? The answer is *managers*. Someone had to plan what was to be done, organize people and materials to do it, make sure those workers got the work done, and impose some controls to ensure that everything was done as planned.

I) PRE SCIENTIFIC MANAGEMENT ERA

Adam Smith's contribution in *Wealth of Nations* outlined the economic advantage that organization and society can gain from the **division of labour**. He used the pin-manufacturing industry for his example. Smith noted that 10 individuals, each doing a specialized task, could produce about 4800 pins a day. However, if each worked separately and had to perform each task, it would be quite an accomplishment to produce even 10 pins a day. Smith concluded that division of labour increased productivity by increasing each worker's skill and dexterity, by saving time lost in changing tasks, and by creating labour-saving inventions and machinery

II) SCIENTIFIC MANAGEMENT ERA

FREDERICK W. TAYLOR :

He is known as 'father of scientific management'.

Four basic parts of a series of ideas developed by Taylor are as follows:

- i) Each person's job should be broken down into elements and a scientific way to perform each element should be determined.
- ii) Workers should be scientifically selected and trained to do the work in the designed and trained manner.
- iii) There should be good cooperation between management and workers so that tasks are performed in the designed manner.
- iv) There should be a division of labour between managers and workers. Managers should take over the work of supervising and setting up instructions and designing the work, and the workers should be free to perform the work himself.

Taylor based his management system on **production- line time studies**. Instead of relying on traditional work methods, he analyzed and timed steel workers' movements on a series of jobs. Using time study as his base, he broke each job down into its components and designed the quickest and best methods of performing each component. In this way he established how

much workers should be able to do with the equipment and materials at hand. He also encouraged employers to pay more productive workers at a higher rate than others, using a "scientifically correct" rate that would benefit both company and worker. Thus, workers were urged to surpass their previous performance standards to earn more pay Taylor called his plan the **differential rate system**.

HENRY L. GANTT

Abandoning the differential rate system as having too little motivational impact, Gantt came up with a new idea. **Every worker** who finished a day's assigned work load would win a **50-cent bonus**. Then he added a second motivation. The **supervisor would earn a bonus** for each worker who reached the daily standard, plus an extra bonus if all the workers reached it. This, Gantt reasoned, would spur supervisors to train their workers to do a better job.

Every worker's progress was rated publicly and recorded on individual bar charts, - - in black on days the worker made the standard, in red when he or she fell below it. Going beyond this, Gantt originated a charting system for production scheduling; the "**Gantt chart**" is still in use today.

THE GILBRETHS

Frank B. and Lillian M. Gilbreth made their contribution to the scientific management movement as a husband- and- wife team. Lillian and Frank collaborated on **fatigue and motion studies** and focused on ways of promoting the individual worker's welfare. To them, the ultimate aim of scientific management was to help workers reach their full potential as human beings.

In their conception, motion and fatigue were intertwined—every motion that was eliminated reduced fatigue. Using motion picture cameras, they tried to find the most economical motions for each task in order to upgrade performance and reduce fatigue. The Gilbreths argued that motion study would raise worker morale because of its obvious physical benefits and because it demonstrated management's concern for the worker.

III) CLASSICAL ORGANIZATION THEORY SCHOOL

Scientific management was concerned with increasing the productivity of the shop and the individual worker. **Classical organization theory** grew out of the need to find guidelines for managing such complex organizations as factories.

HENRI FAYOL

Henri Fayol referred to as father of modern management school.

FAYOL'S 14 PRINCIPLES OF MANAGEMENT

1. **Division of Labor.** Work should be divided among individuals and groups to ensure that effort and attention are focused on special portions of the task. Fayol presented work specialization as the best way to use the human resources of the organization.
2. **Authority and responsibility-** The concepts of Authority and responsibility are closely related. Authority was defined by Fayol as the right to give orders and the power to exact obedience. Responsibility involves being accountable, and is therefore naturally associated with authority. Whoever assumes authority also assumes responsibility.
3. **Discipline.** Members in an organization need to respect the rules and agreements that govern the organization. To Fayol, discipline results from good leadership at all levels of the organization, fair agreements (such as provisions for rewarding superior performance), and judiciously enforced penalties for violations.

4. **Unity of Command.** Each employee must receive instructions from only one person. Fayol believed that when an employee reported to more than one manager, conflicts in instructions and confusion of authority would result.
5. **Unity of Direction.** Those operations within the organization that have the same objective should be directed by only one manager using one plan. For example, the personnel department in a company should not have two directors, each with a different hiring policy.
6. **Subordination of Individual Interest to the Common Good.** In any undertaking, the interests of employees should not take precedence over the interests of the organization as a whole.
7. **Remuneration.** Compensation for work done should be fair to both employees and employers.
8. **Centralization.** Decreasing the role of subordinates in decision making is centralization; increasing their role in decentralization. Fayol believed that managers should retain final responsibility, but should at the same time give their subordinates enough authority to do their jobs properly. The problem is to find the proper degree of centralization in each case.
9. **Scalar chain or the Hierarchy.** The line of authority in an organization—often represented today by the neat boxes and lines of the organization chart—runs in order of rank from top management to the lowest level of the enterprise. Lower level managers should always keep upper level managers informed of their work activities. The existence of a scalar chain and adherence to it are necessary if the organization is to be successful
10. **Order.** Materials and people should be in the right place at the right time. People, in particular, should be in the jobs or positions they are most suited to.
11. **Equity.** Managers should be both friendly and fair to subordinates.
12. **Stability of tenure of personnel.** A high employee turnover rate undermines the efficient functioning of an organization. Retaining productive employees should always be a high priority of management
13. **Initiative.** Subordinates should be given the freedom to conceive and carry out their plans, even though some mistakes may result.
14. **Espirit de Corps.** Promoting team spirit will give the organization a sense of unity. To Fayol, even small factors should help to develop the spirit. He suggested, for example, the use of verbal communications instead of formal, written communication whenever possible.

MAX WEBER

Developed a theory of **bureaucratic management** a form of organization characterized by division of labor, a clearly defined hierarchy, detailed rules and regulations, and impersonal relationships.

MARY PARKER FOLLETT

Follett was convinced that **no one could become a whole person except as a member of a group.** In fact, she called management "the art of getting things done through people." She was a great believer in the power of the group, where individuals could combine their diverse talents into something bigger.

IV) THE BEHAVIORAL SCHOOL

There was increased interest in helping managers deal more effectively with the "**people side**" of their organizations.

THE HUMAN RELATIONS MOVEMENT

Human relations is frequently used as a general term to describe the ways in which managers interact with their employees. When "employee management" stimulates more and better work, the organization has effective human relations; when morale and efficiency deteriorate, its human relations are said to be ineffective. The human relations movement arose from early attempts to systematically **discover the social and psychological factors that would create effective human relations.**

THE HAWTHORNE EXPERIMENTS.

The human relations movement grew out of the famous "Hawthorne Studies" because many of them were performed at Western Electric's Hawthorne plant near Chicago. The Hawthorne Studies began as an attempt to investigate the relationship between the level of lighting in the workplace and worker productivity.

In some of the early studies, the Western Electric researchers divided the employees into experimental groups, who were subjected to deliberate changes in lighting, and control groups, whose lighting remained constant throughout the experiments. It's logical to think that individual output in the experimental group would be directly related to the intensity of the light.

The results of the experiments were ambiguous. However, they found that as the level of light was increased in the experimental group, output for both groups increased. Then, much to the surprise of the engineers, as the light level was decreased in the experimental group, productivity continued to increase in both groups. In fact, a productivity decrease was observed in the experimental group *only* when the level of light was reduced to that of a moonlit night.

Mayo and his associates decided that a complex chain of attitudes had touched off the productivity increases. Because they had been singled out for special attention, both the test and the control groups had developed a group pride that motivated them to improve their work performance.

The researchers concluded that employees would work harder if they believed management was concerned about their welfare and supervisors paid special attention to them. This phenomenon as subsequently labelled the Hawthorne Effect.

V) THE BEHAVIORAL SCIENCE APPROACH

Maslow's Need Hierarchy Theory

According to **Maslow**, the needs that people are motivated to satisfy fall into a hierarchy. The five stage model can be divided into basic (or deficiency) needs (e.g. physiological, safety, love, and esteem) and growth needs (self-actualization). Physiological and safety needs are at the bottom of the hierarchy, and at the top are ego needs (the need for respect, for example) and self actualizing needs (such as the need for meaning and personal growth). In general, Maslow said lower level needs must be satisfied before higher level needs can be met. People are motivated to achieve certain needs.

Mc Gregor's Theory X and Theory Y

McGregor distinguished two alternative basic assumptions about people and their approach to work. These two assumptions, which he called Theory X and Theory Y, take opposite views of people's commitment to work in organizations. Theory X managers, McGregor proposed, assume that people must be constantly coaxed into putting forth effort in their jobs. Theory Y managers, on the other hand, assume that people relish work and eagerly approach their work as an opportunity to develop their creative capacities.

William Ouchi's Theory Z of Motivation

Theory Z focused on increasing employee loyalty to the company by providing a job for life with a strong focus on the well-being of the employee, both on and off the job. According to Dr. [William Ouchi](#), its leading proponent, Theory Z management tends to promote stable employment, high productivity, and high employee morale and satisfaction.

Theory Z is a form of management in which workers are involved in the work process on the factory floor. Schedules, division of labor, work assignments, and other aspects of the labor process are given over to workers to do as they see best. Investment policies, wages, fringe benefits and kind of product are not given over to workers to decide; only how best to do that decided by top management.

Characteristics of the Theory Z

- Long-term employment and job security
- Collective responsibility
- Implicit, informal control with explicit, formalized measures
- Collective decision-making
- Slow evaluation and promotion
- Moderately specialized careers
- Concern for a total person, including their family

VI) RECENT DEVELOPMENTS IN MANAGEMENT THEORY

THE SYSTEMS APPROACH

Rather than dealing separately with the various segments of an organization, the systems approach to management views the organization as a unified, purposeful system composed of interrelated parts. This approach gives managers a way of looking at the organization as a whole and as a part of the larger, external environment. Systems theory tells us that the activity of any segment of an organization affects, in varying degrees, the activity of every other segment.

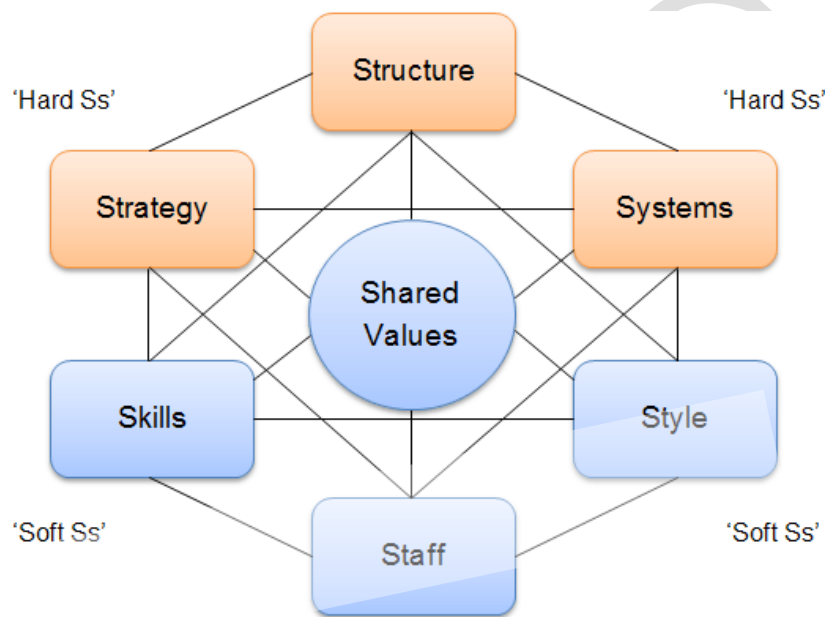
THE CONTINGENCY APPROACH

The contingency approach (sometimes called the situational approach) was developed by managers, consultants, and researchers who tried to apply the concepts of the major schools to real- life situations. When methods highly effective in one situation failed to work in other situations, they sought an explanation. Why, for example, did an organizational development program work brilliantly in one situation and fail miserably in another. Advocates of the contingency approach had a logical answer to all such questions: Results differ because situations differ; a technique that works in one case will not necessarily work in all cases.

According to the contingency approach the manager's task is to identify which technique will, in a particular situation, under particular circumstances, and at particular time, best contribute to the attainment of management goals.

The McKinsey 7-s Framework

McKinsey 7s model is a tool that analyzes firm's organizational design by looking at 7 key internal elements: strategy, structure, systems, shared values, style, staff and skills, in order to identify if they are effectively aligned and allow organization to achieve its objectives.



The key point of the model is that all the seven areas are interconnected and a change in one area requires change in the rest of a firm for it to function effectively. In McKinsey model, the seven areas of organization are divided into the 'soft' and 'hard' areas. Strategy, structure and systems are hard elements that are much easier to identify and manage when compared to soft elements. On the other hand, soft areas, although harder to manage, are the foundation of the organization and are more likely to create the sustained competitive advantage.

Strategy is a plan developed by a firm to achieve sustained competitive advantage and successfully compete in the market.

Structure represents the way business divisions and units are organized and includes the information of who is accountable to whom. In other words, structure is the organizational chart of the firm. It is also one of the most visible and easy to change elements of the framework.

Systems are the processes and procedures of the company, which reveal business' daily activities and how decisions are made. Systems are the area of the firm that determines how business is done and it should be the main focus for managers during organizational change.

Skills are the abilities that firm's employees perform very well. They also include capabilities and competences. During organizational change, the question often arises of what skills the company will really need to reinforce its new strategy or new structure.

Staff element is concerned with what type and how many employees an organization will need and how they will be recruited, trained, motivated and rewarded.

Style represents the way the company is managed by top-level managers, how they interact, what actions do they take and their symbolic value. In other words, it is the management style of company's leaders.

Shared Values are at the core of McKinsey 7s model. They are the norms and standards that guide employee behavior and company actions and thus, are the foundation of every organization.

CHAPTER 2 – CORPORATE SOCIAL RESPONSIBILITY & MANAGERIAL ETHICS

Corporate Social Responsibility

Corporate Social Responsibility means a business firm's intention beyond its legal and economic obligations, to do the right things and act in ways that are good for the society. A socially *responsible* organization views things differently. It goes beyond what it's obligated to do or chooses to do because of some popular social need and does what it can to help improve society because it's the right thing to do.

CSR is "the concept that an enterprise is accountable for its impact on all relevant stakeholders. It is the continuing commitment by business to behave fairly and responsibly, and contribute to economic development while improving the quality of life of the work force and their families as well as of the local community and society at large".

In other words, CSR refers to ensuring the success of the business by inclusion of social and environmental considerations into a company's operations. It means satisfying your shareholders' and customers' demands while also managing the expectation of other stakeholders such as employees, suppliers and the community at large. It also means contributing positively to society and managing your organization's environmental impact. Hence, CSR is a contribution to sustainable development, implying the way a company balances its economic, environmental and social objectives while addressing stakeholder expectations and enhancing shareholder value

Responsibility of Manager's towards various segments of the society

Major responsibility of business towards different sections of society are as : 1. Employees, 2. Owners, 3. Consumers, 4. Government, 5. Shareholders, 6. Community, 7. Environment

Business depends on society for inputs like money, men, and skills and also for market where products have to be sold to the customers. The business depends on society for existence, sustenance and encouragement.

Being so much dependent on society, business also has a definite responsibility towards different segments of society. Though profit making is one of main objectives of business but it has to satisfy employees, consumer, government, community, shareholders also.

1. Employees:

No Enterprise can succeed without the whole-hearted cooperation of the employees. Responsibility of business towards employees is in the form of training, promotion, proper selection, fair wages, safety, health, worker's education, comfortable working conditions, participation management etc.

The employees should be taken into confidence while taking decisions affecting their interests. The workers should be offered incentives for raising their performance. Mental, physical, economic and cultural satisfaction of employees should be taken care of.

2. Owners:

Business is accountable towards owners as well as managing business profitably, ensuring fair and regular return on capital employed, consolidating financial position of business, guaranteeing capital appreciation so as to enable the owners to withstand any business contingencies.

3. Consumers:

Responsibility of business towards consumer extends to:

(i) Product:

Quality goods should be produced and supplied. Distribution system should make goods easily available to avoid artificial scarcities and after sales service should be prompt. Buying capacity and consumer preferences should be taken into consideration while deciding the manufacturing policies. The care must be exercised in supplying the goods of quality which has no adverse effect on the health of consumers.

(ii) Marketing:

To avoid being misled by wrong claims about products through improper advertisements or otherwise, the consumer should be provided full information about the products including their adverse effects, risks and care to be taken while using the products.

4. Government:

A number of legislations are formed from time to time by the government for proper regulation and control of business. Businessmen should comply with all legal requirements, execute government contracts, pay taxes honestly and in time, make services of executives available for government, suggest measures and send proposals to enact new laws for the business.

5. Shareholders:

Shareholders who are the owners of business should be provided with correct information about company to enable them to give them true and fair position of the company to enable them to decide about further investments.

6. Community:

Responsibility of business towards community and society includes spending a part of profits towards civic and educational facilities. Every industrial undertaking should take steps to

dispose of Industrial wastes in such a way that ecological balance is maintained and environmental pollution is prevented.

7. Environment:

Business should protect the environment which has acquired great importance all over the world. Business can discharge the responsibility of protecting environment in following way:

- (i) Preservation of Natural Resources:
- (ii) Pollution Control

Managerial Ethics

Ethics is a branch of social science. It deals with moral principles and social values. It helps us to classify, what is good and what is bad.

Many decisions that managers make require them to consider both the process and who's affected by the result.

Factors That Determine Ethical and Unethical Behavior

Whether someone behaves ethically or unethically when faced with an ethical dilemma is influenced by several things: his or her stage of moral development and other moderating variables including individual characteristics, the organization's structural design, the organization's culture, and the intensity of the ethical issue.

Stage of Moral Development. Research divides moral development into three levels, each having two stages. At each successive stage, an individual's moral judgment becomes less dependent on outside influences and more internalized.

At the first level, the *preconventional* level, a person's choice between right or wrong is based on personal consequences from outside sources, such as physical punishment, reward, or exchange of favors. At the second level, the *conventional* level, ethical decisions rely on maintaining expected standards and living up to the expectations of others. At the *principled* level, individuals define moral values apart from the authority of the groups to which they belong or society in general

Individual Characteristics. Two individual characteristics—values and personality—play a role in determining whether a person behaves ethically. Each person comes to an organization with a relatively entrenched set of personal **values**, which represent basic convictions about what is right and wrong.

Two personality variables have been found to influence an individual's actions according to his or her beliefs about what is right or wrong: ego strength and locus of control. **Ego strength** measures the strength of a person's convictions. **Locus of control** is the degree to which people believe they control their own fate.

Structural Variables. An organization's structural design can influence whether employees behave ethically. Those structures that minimize ambiguity and uncertainty with formal rules and regulations and those that continuously remind employees of what is ethical are more likely to encourage ethical behavior

Management's Role in encouraging ethical behaviour

The behavior of managers is the single most important influence on an individual's decision to act ethically or unethically. Some specific ways managers can encourage ethical behavior include paying attention to employee selection, having and using a code of ethics, recognizing the important ethical leadership role they play and how what they do is far more important than what they say, making sure that goals and the performance appraisal process don't reward goal achievement without taking into account how those goals were achieved, using ethics training and independent social audits, and establishing protective mechanisms.

- a) Formal mechanism for monitoring ethics
- b) Written organisational codes of conduct
- c) Widespread communication of ethics and social responsibility
- d) Leadership by example
- e) Training programmes in ethics and social responsibility

NCERC

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MODULE 3

PLANNING

CHAPTER 1 – PLANNING FUNCTION

Planning Function of Management

Planning is deciding in advance what to do and how to do. It is one of the basic managerial functions. Planning involves selecting missions and objectives and deciding on the actions to achieve them; it requires decision making, that is, choosing a course of action from among alternatives

Planning bridges the gap from where we are to where we want to go.

Nature of Planning

1. **Planning is goal-oriented:** Every plan must contribute in some positive way towards the accomplishment of group objectives. Planning has no meaning without being related to goals.
2. **Primacy of Planning:** Planning is the first of the managerial functions. It precedes all other management functions.
3. **Pervasiveness of Planning:** Planning is found at all levels of management. Top management looks after strategic planning. Middle management is in charge of administrative planning. Lower management has to concentrate on operational planning.
4. **Efficiency, Economy and Accuracy:** Efficiency of plan is measured by its contribution to the objectives as economically as possible. Planning also focuses on accurate forecasts.
5. **Co-ordination:** Planning co-ordinates the what, who, how, where and why of planning. Without co-ordination of all activities, we cannot have united efforts.
6. **Limiting Factors:** A planner must recognize the limiting factors (money, manpower etc) and formulate plans in the light of these critical factors.
7. **Flexibility:** The process of planning should be adaptable to changing environmental conditions.
8. **Planning is an intellectual process:** The quality of planning will vary according to the quality of the mind of the manager.

Importance of Planning

1. **Planning increases the organization's ability to adapt to future eventualities:** The future is generally uncertain and things are likely to change with the passage of time. The uncertainty is augmented with an increase in the time dimension. With such a rise in uncertainty there is generally a corresponding increase in the alternative courses of action from which a selection must be made. The planning activity provides a systematic approach to the consideration of such future uncertainties and eventualities and the planning of activities in terms of what is likely to happen.

2. ***Planning helps crystallize objectives:*** The first step in planning is to fix objectives which will give direction to the activities to be performed. This step focuses attention on the results desired. A proper definition and integration of overall and departmental objectives would result in more co-ordinated inter-departmental activities and a greater chance of attaining the overall objectives.
3. ***Planning ensures a relatedness among decisions:*** A crystallization of objectives as mentioned above would lead to a relatedness among the decisions which would otherwise have been random. Decisions of the managers are related to each other and ultimately towards the goals or objectives of the enterprise. Creativity and innovation of individuals is thus harnessed towards a more effective management of the company.
4. ***Planning helps the company to remain more competitive in its industry:*** Planning may suggest the addition of a new line of products, changes in the methods of operation, a better identification of customer needs and segmentation and timely expansion of plant capacity all of which render the company better fitted to meet the inroads of competition.
5. ***Adequate planning reduces unnecessary pressures of immediacy:*** If activities are not properly planned in anticipation of what is likely to happen, pressures will be exerted to achieve certain results immediately or in a hurry. Thus adequate planning supplies orderliness and avoids unnecessary pressures.

Types of Plans

Plans can be described by their breadth, time frame, specificity, and frequency of use

1. On the basis of Breadth or scope plans can be Strategic, tactical or operational plans.

Strategic plans (long-term plans) are plans that apply to the entire organization, establish the organization's overall goals, and seek to position the organization in terms of its environment.

Tactical plans are detailed programmes designed to implement the strategic goals and plans formulated by the top management.

Operational plans (short-term plans) are plans that specify the details of how the overall goals are to be achieved.

2. On the basis of Time frame plans can be Short-term, medium term or long-term plans.

Short-term plans are plans that cover one year or less. These are formulated when the organizations want to accomplish their goals within a short span of time. These plans normally become tools for management of day-to-day activities in departments, divisions etc. They are the steps that lead to the fulfillment of long-term objectives. Operational plans are forms of short term plans.

Medium term plans define the organizational activities that are essential for the execution of long term plans and goals. These plans are useful for middle-level managers as they offer directions to them. They normally cover a time horizon of 1-2 years. Tactical plans are forms of medium term plans.

Long-term plans are plans with a time frame beyond three years. They are prepared when organizations require long periods of time to reach their goals. These plans provide a big picture of an organization and also indicate its future direction. Top management is involved in formulating these plans. Strategic plans are long term plans.

3. On the basis of Specificity plans can be Specific or directional plans.

Specific plans are plans that are clearly defined and leave no room for interpretation. These are apt for organizations which enjoy a stable external and internal environment. Eg a plan that aims at cutting production cost by 3 % in one year.

Directional plans are flexible plans that set out general guidelines. They provide a general direction in which the organization proposes to move forward but there are no specific plan deadlines. These plans are best suited for uncertain and volatile organizations. Eg a plan that aims at increasing corporate profit between 4 % and 6 %.

4. On the basis of Frequency of use plans can be Single-use or standing plans. A single-use plan is a one-time plan specifically designed to meet the needs of a unique situation. Eg Programmes and budgets. Standing plans are ongoing plans that provide guidance for activities performed repeatedly. Eg Policy, procedure, rules.

Classification of plans

Purposes or missions: It identifies the **basic functions or task of an enterprise**. The purpose of a business is generally of production and distribution of goods and services. The purpose of a state highway department is designing, building, and operating a system of state highways.

Objectives: Objectives are **ends** towards which the management seeks to achieve by its operations. They serve as a guide for overall business planning. The objective of a firm might be to make a certain profit.

Strategy: A strategy is the determination of the **basic long term objectives** of an enterprise and adoption of **courses of action** and **allocation of resources** necessary to achieve these goals

A strategy may include such major policies as marketing directly rather than distribution.

Policy: They are **general statements** meant to bring out a consistency in decision making. For example company policy may grant annual vacations to employees

Procedure: They are plans that establish a required **method of handling future activities**. Procedures are routine steps on how to carry out activities. Procedures are specified steps to be followed in particular circumstances. For example in a manufacturing company, the procedure for handling orders may involve the sales department (for the original order), the finance department (for acknowledgement of receipt of funds and for customer credit approval), the accounting department (for recording the transaction), the production department (for the order to produce the goods or the authority to release from stock), and the shipping department (for determination of shipping means and routes)

Rule: Rules are **specific statements that spell out required actions or non actions, allowing no discretion**. Eg No smoking

Programme: Programmes are detailed statements about a project which outlines the objectives, policies, procedures, rules, tasks, human and physical resources required and the budget to implement any course of action. Eg An airline's programme to acquire a \$400 million fleet of jets.

Budget: It is a plan which quantifies future facts and figures.

Levels of planning

In management theory, it is usual to consider that there are three basic levels of [planning](#), though in practice there may be more than three levels of management and to an extent, there will be some overlapping of planning operations. The three levels of planning are discussed below:

1. **Top level planning:** also known as overall **or strategic planning**, top level planning is done by the top management, i.e., board of directors or governing body. It encompasses the long-range objectives and policies or organisation and is concerned with corporate results rather than sectional objectives. Top level planning is entirely long-range and inextricably linked with long-term objectives. It might be called the 'what' of planning.
2. **Middle level planning:** also known as **tactical planning**, it is done by middle level managers or departmental heads. It is concerned with 'how' of planning. It deals with development of resources to the best advantage. It is concerned mainly, not exclusively, with long-range planning, but its nature is such that the time spans are usually shorter than those of strategic planning. This is because its attentions are usually devoted to the step-by-step attainment of the organisation's main objective. It is, in fact, oriented to functions and departments rather than to the organisation as a whole.
3. **Lower level planning:** also known as **operational planning**, it is the concern of departmental managers and supervisors. It is confined to putting into effect the tactical or departmental plans. It is usually for a short-term and may be revised quite often to be in tune with the tactical planning.

Comparison of strategic, tactical and operational planning

Nature	Strategic planning	Tactical planning	Operational planning
Management level	Top level	Middle level	Supervisory level
Duration	Long term	Medium term	Short term
Coverage	Whole organisation	Functional areas like production, marketing etc	Departments, teams etc
Scope of guidelines	Broad and general	Neither too general nor too specific	Too specific
Purpose of planning	Goal and objective formulation	Developing procedures for goal formulation	Goal implementation and controlling
Decision making	Centralised	Decentralised	Decentralised

Planning Process

1. **Being aware of opportunities** – All managers should take a preliminary look at possible future opportunities and see them clearly and completely, know where their company stands in light of its strengths and weaknesses, understand what problems it has to solve and why and know what it can expect to gain. Awareness of opportunities should be made in light of the market, competition, what customers want, our strengths and our weaknesses.
2. **Setting objectives:** Objectives may be set for the entire organisation and each department or unit within the organisation. Objectives specify the end results and indicate the end points of what is to be done, where primary emphasis is to be placed, and what is to be accomplished by network of strategies, policies, procedures, rules, budgets and programs.
3. **Developing premises:** Premises means the assumptions about the environment in which the plan is to be carried out. It is important for all managers involved in the planning process to agree on the premises. The more thoroughly individuals charged with planning understand and agree to utilise consistent planning premises, the more coordinated the enterprise planning will be.
4. **Determining alternative courses:** Search for and examine alternative courses of action.
5. **Evaluating alternative courses:** The next step is to weigh the pros and cons of each alternative.
6. **Selecting an alternative:** This is the real point of decision making. The best plan has to be adopted and implemented.
7. **Implement the plan:** This is concerned with putting the plan into action.

8. **Follow-up action:** Monitoring the plans are equally important to ensure that objectives are achieved.

Principles of Planning

1. Principle of contribution to objectives – The purpose of planning is the effective and efficient achievement of objectives.
2. Principle of primacy of planning – Planning precedes all other function of management
3. Principle of efficiency of plans – The efficiency of plans is measured on the basis of optimum costs to achieve the objectives successfully
4. Principle of planning premises – Every plan is based on carefully considered assumptions
5. Principle of limiting factor – While choosing an appropriate course of action amongst different alternatives, the limiting factor such as money, materials, machines, manpower etc should be considered
6. Principle of flexibility – There should be flexibility in the plans

Essentials of effective planning

1. Simple – A good plan must be simple and comprehensive. All employees should understand the significance and it can be easily put into operation
2. Clear and well defined objectives – A good plan must not contain anything indefinite or ambiguous. It should be well defined
3. Well balanced and flexible –It should be broad enough to meet future challenges and uncertainties
4. Time bound – The time period for achieving the objectives should be reasonable.
5. Participation by subordinates – Planning should not be the exclusive responsibility of top management. It should involve participation of subordinates.
6. Practical – Plans should be implemented easily
7. Economical – Plans should not involve unnecessary expenses on decision making, implementation and evaluation

Barriers to effective planning

1. Uncertain future – Future is full of uncertainty. .
2. Resistance to change – Members of an organisation may resist changes due to implementation of plans
3. Inadequate resources – The success of planning depends critically on resources available. In the event of non-availability of adequate resources, managers will have to limit plan related activities
4. Lack of effective communication – When plans are not adequately communicated to the participants, managers will fail to get their commitment and cooperation
5. Improper contribution to planning activities at different levels – Since most of the planning is done by top management, the middle and lower level management which are closer to the operations may not understand all aspects of planning and therefore may not be able to contribute some necessary key factors as input.

Approaches to planning

1. Top-down approach – In most family owned businesses, the authority and responsibility for planning is centralised at the top. The top management defines the mission, lays down strategies and specifies action plans to achieve the stated goals. The plan is then passed to people working at lower level who have little to contribute to the process of planning
2. Bottom – up approach – Lower level management are drawn into the preparation and implementation of plans, their loyalty and commitment would go up.
3. Composite approach – A middle path is chosen to facilitate the smooth implementation of plans. Top level offers guidelines, sets boundaries and encourages the middle and lower level executives to come out with tentative plans. Then they discuss and debate. Once approved, such plans gain acceptance readily since everyone has been drawn into the exercise.

Forecasting

A technique managers can use to assess the environment is forecasting. Forecasting is an important part of planning and managers need forecasts that will allow them to predict future events effectively and in a timely manner. Environmental scanning establishes the basis for forecasts, which are predictions of outcomes.

I Qualitative methods or Opinion and judgemental methods

- Deals with
 - What do people say
 - What do they do. Useful in forecasting for new product or new market for which no past data available

A. Consumer's Opinion Survey

- Buyers are asked about their future buying intentions of products, their brand preferences and quantity of purchase.
- Possible response to increase in price, probable change in product's feature and competitive product.

B Sales force Opinion

- Salespersons are asked about their estimated sales target in their respective sales territories in a given period of time.
- Sum total of such estimates form the basis of forecasted demand.

C. Jury of expert opinion

The views of experts from sales, production, finance, purchasing and administration are averaged to generate a forecast about future sales as they are well informed about the company's market position, capabilities, competition and market trend

D. Delphi Technique

It is similar to jury of experts. In this a panel of experts is asked to respond to a series of questionnaires. The responses are tabulated and opinions of the entire group are made known to each other panel members so that they may revise their previous forecast response. The process continues until some degree of consensus is achieved

I Quantitative methods

It relies on numerical data and mathematical models to predict future conditions. It is used when historical data is available.

The different methods of quantitative analysis are :

1. Time series analysis- Fits a trend line to a mathematical equation and projects into the future by means of this equation. Predicting next quarter's sales on the basis of 4 years of previous sales data
2. Regression models - Predicts one variable on the basis of known or assumed other variables. Seeking factors that will predict a certain level of sales (e.g., price, advertising expenditures)
3. Econometric models - Uses a set of regression equations to simulate segments of the economy. Predicting change in car sales as a result of changes in tax laws

SWOT Analysis

Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis is a technique suitable for early stages of strategic planning process. A scan of the internal and external environment is an important part of the strategic planning process. Internal environment factors are strengths and weaknesses while external environment factors are opportunities and threats. SWOT analysis provides information that is helpful in matching the firm's resources and capabilities to the competitive environment in which it operates.

Strengths: factors that give an edge for the company over its competitors. Eg Employee strengths, skills, location etc

Weaknesses: factors that can be harmful if used against the firm by its competitors. Eg employee turnover, employee absenteeism

Opportunities: favorable situations which can bring a competitive advantage. Eg change in government policies

Threats: unfavorable situations which can negatively affect the business. Eg change in legal policies, political instability

	Opportunities (external, positive)	Threats (external, negative)
Strengths (internal, positive)	Strength-Opportunity strategies Which of the company's strengths can be used to maximize the opportunities you identified?	Strength-Threats strategies How can you use the company's strengths to minimize the threats you identified?
Weaknesses (internal, negative)	Weakness-Opportunity strategies What action(s) can you take to minimize the company's weaknesses using the opportunities you identified?	Weakness-Threats strategies How can you minimize the company's weaknesses to avoid the threats you identified?

Management by Objectives (MBO)

MBO was first popularized by Peter Drucker in 1954 in his book 'The practice of Management'.

Instead of using traditional goal setting, many organizations use management by objectives (MBO), a process of setting mutually agreed-upon goals and using those goals to evaluate employee performance. It is a process of agreeing within an organization so that management and employees buy into the objectives and understand what they are. It has a precise and written description objectives ahead, timelines for their monitoring and achievement. The employees and manager agree to what the employee will attempt to achieve in a period ahead and the employee will accept and buy into the objectives. It is process whereby the superior and subordinate managers of an enterprise jointly identify the common goals of the enterprise, define each individuals responsibility in terms of result expected of him and use the objectives developed as guidelines for operating the unit and assessing the contribution of each of its members.

MBO programs have four elements – goal specificity, participative decision making, an explicit time period and performance feedback. Instead of using goals to make sure employees are doing what they are supposed to be doing, MBO uses goals to motivate them as well.

Definition

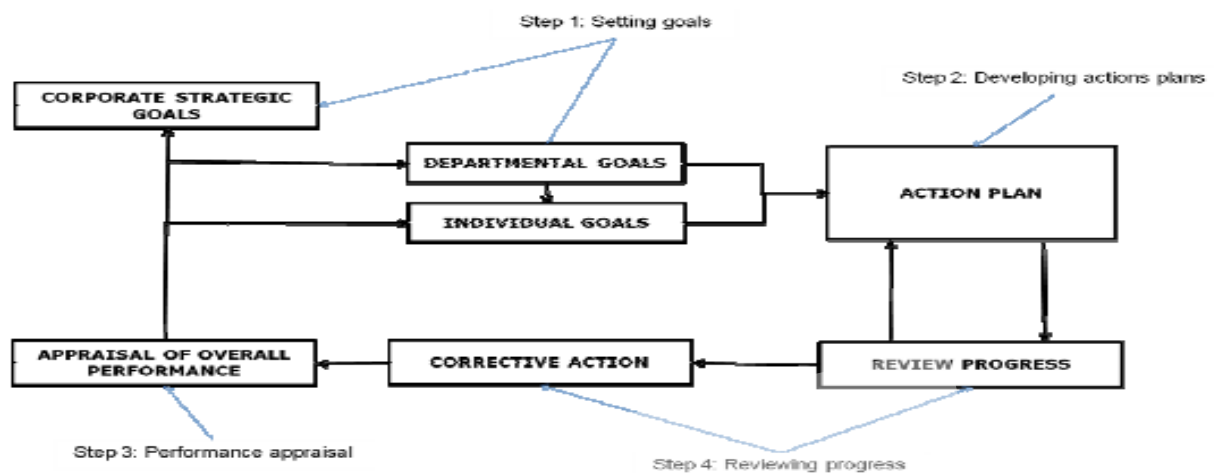
“MBO is a process whereby the superior and the managers of an organization jointly identify its common goals, define each individual’s major area of responsibility in terms of results expected of him, and use these measures as guides for operating the unit and assessing the contribution of each of its members.”

Features of MBO

1. Superior subordinate participation – MBO requires the superior and the subordinate to recognize that the development of objectives is a joint project

2. Joint goal setting – The subordinate in consultation with his superior sets his own short term goals. Participation encourages commitment
3. Joint decision on methodology – MBO focuses attention on what must be achieved rather than how to achieve it. The superior and subordinate together devise the methodology
4. Makes way to attain maximum result – MBO is a systematic and rational technique that allows management to attain maximum results from available resources by focussing on attainable goals.
5. Support from superior – When subordinate makes efforts to achieve his goals the superiors helping hand is always available

Steps in MBO:



1) Setting objectives:

For Management by Objectives (MBO) to be effective, individual managers must understand the specific objectives of their job and how those objectives fit in with the overall company objectives set by the board of directors.

The managers of the various units or sub-units, or sections of an organization should know not only the objectives of their unit but should also actively participate in setting these objectives and make responsibility for them.

Peter Drucker used the acronym SMART (Specific, Measurable, Achievable, Realistic and Time bound)

2) Developing action plans

Actions plans specify the actions needed to address each of the top organizational issues and to reach each of the associated goals, who will complete each action and according to what timeline. An overall, top-level action plan that depicts how each strategic goal will be reached is developed by the top level management.

3) Reviewing Progress:

Performance is measured in terms of results. Job performance is the net effect of an employee's effort as modified by abilities, role perceptions and results produced.

4) Performance appraisal:

Performance appraisals communicate to employees how they are performing their jobs, and they establish a plan for improvement. Performance appraisals are extremely important to both employee and employer, as they are often used to provide predictive information related to possible promotion. Appraisals can also provide input for determining both individual and organizational training and development needs.

Advantages

- Motivation – Involving employees in the whole process of goal setting and increasing employee empowerment. This increases employee job satisfaction and commitment.
- Better communication and Coordination – Frequent reviews and interactions between superiors and subordinates helps to maintain harmonious relationships within the organization and also to solve many problems.
- Clarity of goals
- Subordinates have a higher commitment to objectives they set themselves than those imposed on them by another person.
- Managers can ensure that objectives of the subordinates are linked to the organization's objectives.

Limitations

There are several limitations to the impact of managing by objectives, including:

- It over-emphasizes the setting of goals over the working of a plan as a driver of outcomes.
- It underemphasizes the importance of the environment or context in which the goals are set. That context includes everything from the availability and quality of resources, to relative buy-in by leadership and stake-holders.
- Companies evaluate their employees by comparing them with the "ideal" employee. Trait appraisal only looks at what employees should be, not at what they should do. When this approach is not properly set, agreed and managed by organizations, self-centered employees might be prone to distort results, falsely representing achievement of targets that were set in a short-term, narrow fashion.

NCERC

MODULE 4

ORGANISING FOR DECISION MAKING

NCCERC

CHAPTER 1 – ORGANISING FUNCTION

Organizing Function of Management

Organising is the process of defining and grouping activities and establishing authority relationships among them to attain organizational objectives.

"Organization involves the grouping of activities necessary to accomplish goals and plans, the assignment of these activities to appropriate departments and the provision of authority, delegation and co-ordination."

Nature or Characteristics of Organising

(1) Division of Work: Division of work is the basis of an organization. Under division of work the entire work of business is divided into many departments. The work of every department is further sub-divided into subworks. In this way each individual has to do the same work repeatedly which gradually makes that person an expert.

(2) Coordination: Under organizing different persons are assigned different works but the aim of all these persons happens to be the same - the attainment of the objectives of the enterprise. Organization ensures that the work of all the persons depends on each other's work even though it happens to be different.

(3) Plurality of Persons: Organization is a group of many persons who assemble to fulfill a common purpose. A single individual cannot create an organization.

(4) Common Objectives: There are various parts of an organization with different functions to perform but all move in the direction of achieving a general objective.

(5) Well-defined Authority and Responsibility: Under organization a chain is established between different posts right from the top to the bottom. It is clearly specified as to what will be the authority and responsibility of every post

Importance of Organizing

Specialization: The work of an organization is separated into units and departments through an organizational network of associations. This helps in getting specialization in different areas of work in an organization.

Well-defined jobs: Organizational structure aids in getting the right people to do the job by choosing people in accordance with their skills, knowledge and qualifications for working in different departments of the organization. This aids in properly defining the work of an organization which further aids in explaining the responsibilities of each person.

Clarifies authority: Organizational structure aids in helping the manager to understand each person's role. This can be achieved in the manager being able to understand clearly how he has to use his powers. This aids in an increase in production as jobs and responsibilities that are well defined make the manager's jobs much more efficient.

Co-ordination: Organization is a process of establishing co-ordination amongst various departments and it also aids in defining relations amongst various positions and individuals assisting each other. If the managers at a higher level implement their power over the network of activities of managers at lower levels, it can bring about efficiency in work.

Effective administration: The organizational structure aids in clarifying the positions of the jobs. The roles and responsibilities of different managers are well-defined and by dividing the work it is easy to achieve specialization. This further aids in an organization that is well-organized and efficient.

Organising Process

Determination of Objectives: Determination of objectives will consist in deciding as to why the proposed organization is to be set up and, therefore, what will be the nature of the work to be accomplished through the organization

Division of work: The first process of Organising includes identification and division of work which shall be done in accordance with the plans that are determined previously.

Departmentation: once the work of identifying and dividing the work has been done those that are similar are to be grouped together.

Linking departments: When the process of departmentation was completed, linking of departments has to be done so that those departments operate in a co-ordinated manner which gives a shape to overall organisation structure.

Assigning Duties: On completion of departmentation process assigning duties i.e. defining authority and responsibility to the employees on the basis of their skills and capabilities has to be done, which in consequence magnifies efficiency with regard to their work.

Defining hierarchal structure: Each employee should also know from whom he has to take orders and to whom he is accountable/responsible.

Principles of organizing

1. Principle of unity of objectives – An organisation must have clearly defined objective. Organisational structure is effective if it facilitates the contribution made by all individuals in the enterprise towards the attainment of objectives of the enterprise.
2. Principle of span of control - span of control is a span of supervision which depicts the number of employees that can be handled and controlled effectively by a single manager. According to this principle, a manager should be able to handle what number of employees under him should be decided.
3. Principle of scalar chain - Scalar chain is a chain of command or authority which flows from top to bottom. With a chain of authority available, wastages of resources are minimized, communication is affected, overlapping of work is avoided and easy organization takes place.
4. Principle of Unity of command - It implies one subordinate-one superior relationship. Every subordinate is answerable and accountable to one boss at one time. This helps in avoiding communication gaps and feedback and response is prompt.
5. Principle of authority and responsibility – Manager should keep a balance between authority and responsibility
6. Principle of specialisation - the whole work of a concern should be divided amongst the subordinates on the basis of qualifications, abilities and skills. It is through division of work specialization can be achieved which results in effective organization

Span of Control

Span of Control means the number of subordinates that can be managed efficiently and effectively by a superior in an organization. It suggests how the relations are designed between a superior and a subordinate in an organization.

Factors Affecting Span of control:

- a) Capacity of Superior:

Different ability and capacity of leadership, communication affect management of subordinates.

b) Capacity of Subordinates:

Efficient and trained subordinates affects the degree of span of management.

c) Nature of Work:

Different types of work require different patterns of management.

d) Degree of Centralization or Decentralization:

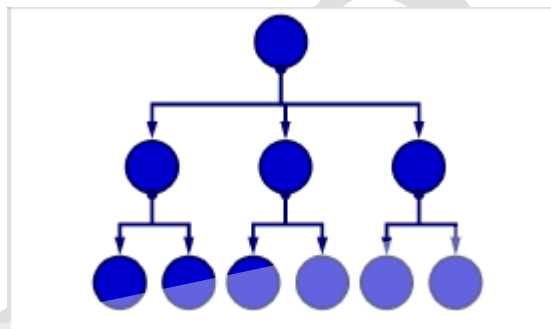
Degree of centralization or decentralization affects the span of management by affecting the degree of involvement of the superior in decision making.

e) Degree of Planning:

Plans which can provide rules, procedures in doing the work higher would be the degree of span of management.

Span of control is of two types:

1. Narrow span of control: Narrow Span of control means a single manager or supervisor oversees few subordinates. This gives rise to a tall organizational structure.



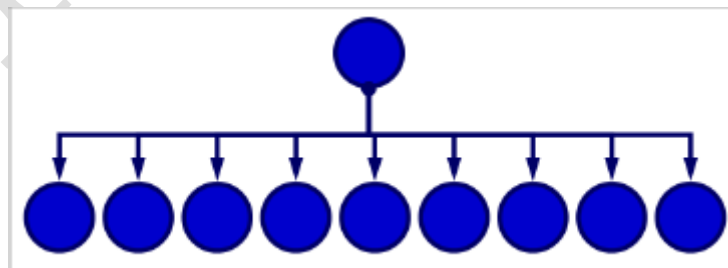
Advantages:

- Close supervision
- Close control of subordinates
- Fast communication

Disadvantages:

- Too much control
- Many levels of management
- High costs
- Excessive distance between lowest level and highest level

2. Wide span of control: Wide span of control means a single manager or supervisor oversees a large number of subordinates. This gives rise to a flat organizational structure



Advantages:

- More Delegation of Authority

- Development of Managers
- Clear policies

Disadvantages:

- Overloaded supervisors
- Danger of superiors loss of control
- Requirement of highly trained managerial personnel
- Block in decision making

Types of Organisation Structure

There are two types of organisation structure – Formal organisation structure and Informal Organisation structure

Formal organisation means an intentional structure of roles in a formally organised enterprise. It refers to the structure of jobs and positions with defined functions and relationships. This type of organisation is built by the management to realise its objectives.

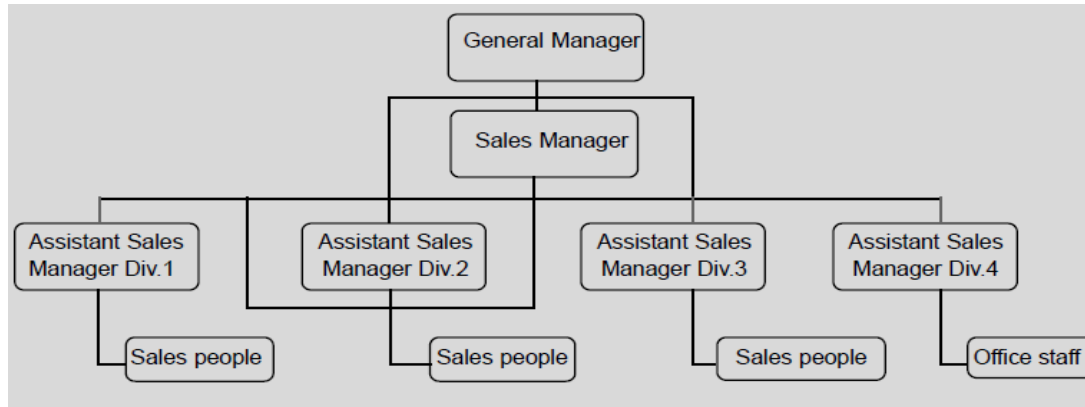
Informal organisation is a network of interpersonal relationships that arise when people interact with each other. It refers to the relationships between people based not on procedures but on personal attitudes, prejudices, likes and dislikes.

TYPES OF FORMAL ORGANISATIONAL STRUCTURE

a. Line Organisation

It is perhaps the oldest and the simplest organisational structure. Line functions are those which have direct responsibility for accomplishing the objective of the enterprise. In this kind of structure every manager exercise a direct authority over his subordinate who in turn directly reports to their superiors.

- There is a hierarchical arrangement of authority.
- Each department is self contained and works independently of other departments.
- Lines of authority are vertical i.e. from top to bottom.
- There are no staff specialists.



Advantages

- Simple to establish and operate
- Promotes prompt decision making.
- Easy to control as the managers have direct control over their subordinates.
- Communication is fast and easy as there is only vertical flow of communication.

Disadvantages

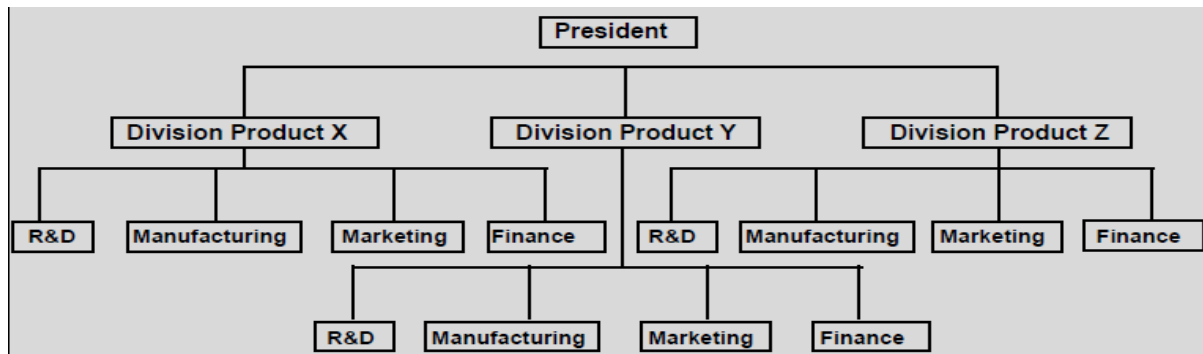
- Lack of specialisation
- Managers might get overloaded with too many things to do.
- Failure of one manager to take proper decisions might affect the whole organisation.

However, line structures are suitable for

- small businesses where there are few subordinates
- organisations where there is largely of routine nature and methods of operations are simple.

b. Functional Organisation

Under this system, the whole task of management and direction of subordinates is divided according to the type of work involved. The organisation is divided into a number of functional areas. This organisation has grouping of activities in accordance with the functions of an organisation such as production, marketing, finance, human resource and so on. The specialist in charge of a functional department has the authority over all other employees for his function.



Advantages

- Is logical and reflection of functions
- Follows principle of occupation specialisation
- Simplifies training
- Better control as the manager in charge of each functional department is usually a specialist.

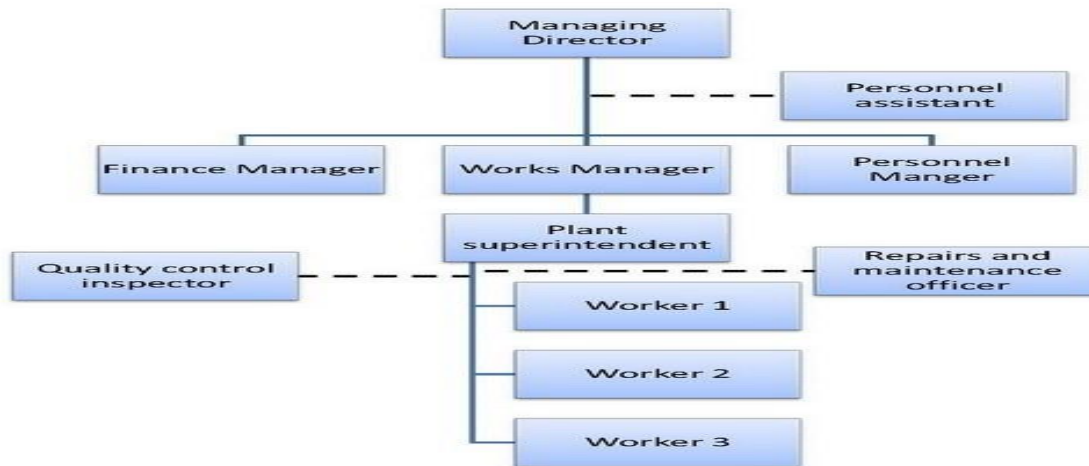
Disadvantages

- Reduced coordination between functions.
- Conflicts between different functions could be detrimental for the organisation as a whole.
- Difficult for general managers to coordinate different departments.

However, it is much suitable for large organisations where there is ample scope for specialisation. Once harmony and proper coordination among different functions is achieved, it could lead to sure success for an organisation.

c. Line and Staff Organisation

It is a combination of line and functional structures. Under this organisation the “line” is supported by the “staff”. Staff personnel acts as an advisory group adjacent to the line. In this organisation structure, the authority flows in a vertical line and gets the help of staff specialist who are in advisory. When the line executives need advice, information about any specific area, these staff specialists are consulted. For example Chief accountant has command authority over accountants and clerks in the accounts departments but he has only advisory relationship with other departments like production or sales.



Advantages

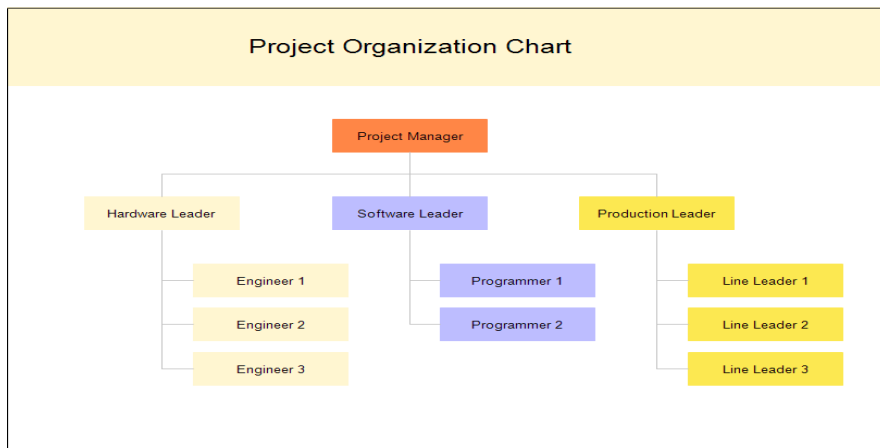
- Line managers are provided expert advice by these specialists.
- Staff managers provide specialist advice which can improve quality of decisions in various departments.

Disadvantages

- Line managers and staff managers might have conflicts on particular issues.
- Line and staff managers might not be clear as to what the actual area of operations is and what is expected of them. Co-ordination may be a problem.

d. Project Organisation

Project organisation is not a separate type of organisation like the line, functional or line and staff organisation; rather it is set up within an organisation for the purpose of completing a project or accomplishing assigned objectives in time and within cost and profit goals laid down by the management. The project structure consists of a number of horizontal organisational units to complete projects of a long duration. A team of specialists from different areas is created for each project. Usually this team is managed by the project manager. The project staff is separate from and independent of the functional departments.



Advantages

- Special attention can be provided to meet the complex demand of the project.
- It allows maximum use of specialist knowledge thus chances of failure are very less.
- Project staff works as a team towards common goal which results in high motivation level for its members.

Disadvantages

As the project staff consists of personnel from diverse fields, it might be quite challenging for the project manager to coordinate among them.

e. Matrix Organisation

- Matrix organisation combines two structures – functional departmentation and project structure.
- Functional department is a permanent feature of the matrix structure and retains authority for overall operation of the functional units.
- Project teams are created whenever specific projects require a high degree of technical skill and other resources for a temporary period.
- Project team form the horizontal chain and functional departments create a vertical chain of command.
- Members of a particular team are drawn from the functional departments and are placed under the direction of a project manager who has the overall responsibility of a particular project.



Matrix Organisation Structure

Determinants of organizational structure

1. Environment – An organization's structure is affected by its environment because of environmental uncertainty. Some organizations face relatively static environments, ie few forces in the environment are changing. Other organizations face very dynamic environments, which are rapidly changing. One word to reduce environmental uncertainty is through adjustments in the organization structure.

2. Strategy – There is a close relation between the organizational strategy and its structure. The understanding of this relationship is important so that in implementing the strategy, the organization structure is designed according to the needs of the strategy. Without coordination between structure and strategy there would be confusion and misdirection within the organization.

3. Size – Organization size is defined as the total number of employees. The larger an organization becomes, the more complicated is its structure. When an organization is small its structure is simple. In a small organization it may not sometimes have a formal organization structure. Individuals may simply perform tasks based on their likes, dislikes, ability or need. As an organization becomes bigger it becomes difficult to operate without a formal organization structure.

4. Organization life cycle – As an organization ages it tends to be more larger. Hence the need for a more formal organization structure.

5. Technology – Technology refers to the methods used in production. The process that transforms inputs to outputs differ by their degree of routineness. The more routine the technology the more standardized the structure.

Departmentation

Determining the functions to be performed involves consideration of division of labour, this is usually accomplished by a process of departmentation. Grouping related functions into manageable units to achieve the objectives of the enterprise in the most efficient and effective manner is departmentation.

Departmentation is the process by which similar activities of the business are grouped into units for the purpose of facilitating smooth administration at all levels.

Purpose of departmentation

1. Group the individuals with common background and shared characteristics
2. Define relationships of positions within an organisation
3. Establish formal lines of authority and fix clear responsibility
4. Provide job specialisation to the members
5. Increase economies of scale (cost reduction through enhanced production)

Types of departmentation

Function wise Departmentation

When departments are formed on the basis of the specialized activities or functions performed by an organization, it is called functional departmentation.

The advantages of this type of structure are as follows:

- (i) It is a logical reflection of functions.
- (ii) It follows the principle of specialisation.
- (iii) Maintains power and prestige of major functions.
- (iv) Inter-departmental co-ordination is facilitated.
- (v) The structure is simple, logical and easy to understand.

There are also some disadvantages:

- (i) Responsibility for profits tends to be at the top.
- (ii) There may be chances of heavy centralisation in decision-making.
- (iii) Where geographical centralisation is desirable or required, this form becomes unsuitable.
- (iv) This is not very suitable where product lines have to be emphasized.
- (v) There is a lower potential for manager development.

Product wise Departmentation

Grouping of activities based on product lines or products is product wise departmentation. In this kind of departmentation, all activities connected with each product, including its production, marketing etc are grouped together under one department. For eg in an automobile

manufacturing company, departments may be created for two wheelers, three wheelers, four wheelers etc

The advantages of this type of structure are:

- (i) Places greater effort on individual product line.
- (ii) Better customer service arising from greater product knowledge.
- (iii) Simplifies departmentation of profitability of each product line. Responsibility for profits is at the Division level.
- (iv) Improves co-ordination of functional activities.
- (v) New department may be added without difficulty. Permits growth and diversity of products and services.

Some of the disadvantages inherent in such departmentation are:

- (i) A customer has to deal with different salesmen or managers for different products of the same company.
- (ii) Extra costs of maintaining separate sales force for each product.
- (iii) Duplication of costs on travel, etc.
- (iv) Tends to make maintenance of economical central services difficult.
- (v) Results in increased problems of the top management control.

Territorial or Geographical Departmentation

When organisations are spread out throughout the world or have territories in many parts of the country, departmentation by geographic area may provide better service to customers and be more cost effective. It may be important that activities in a given territory be grouped and assigned to a manager.

The advantages of such departmentation are:

- (i) Regional expertise is generated and managers can tackle customers or competition better. Places responsibility at lower levels.
- (ii) Proximity will reduce costs of operation and administration.
- (iii) Places emphasis on local markets and problems. Local conditions might warrant different types of selling. This is possible only in territorial departmentation.
- (iv) Improves co-ordination at the regional level.
- (v) Better face-to-face communication with local interests in mind.

Some disadvantages are listed as follows:

- (i) Involves higher costs of co-ordination and control from headquarters.
- (ii) Results in more managerial levels which increases overhead costs.
- (iii) Unsuitable for departments like Finance, where no gains are possible by specialisation on local factors.
- (iv) Increases problems of the top management control.

Departmentation by Customers

When the organizational activities are grouped on the basis of the type of customers served, it is called customer departmentation. The primary purpose of this form of departmentalization

is to ensure that organizations respond to the requirements of a specific customer groups efficiently. Example in case of banks there could be corporate banking, agricultural banking, institutional banking, community banking etc.

Some advantages of this type of structure are:

- (i) Greater specialized customer service.
- (ii) Where marketing channels are considerably different for various types of customers, this type of structure is very useful.

Some disadvantages of this type are:

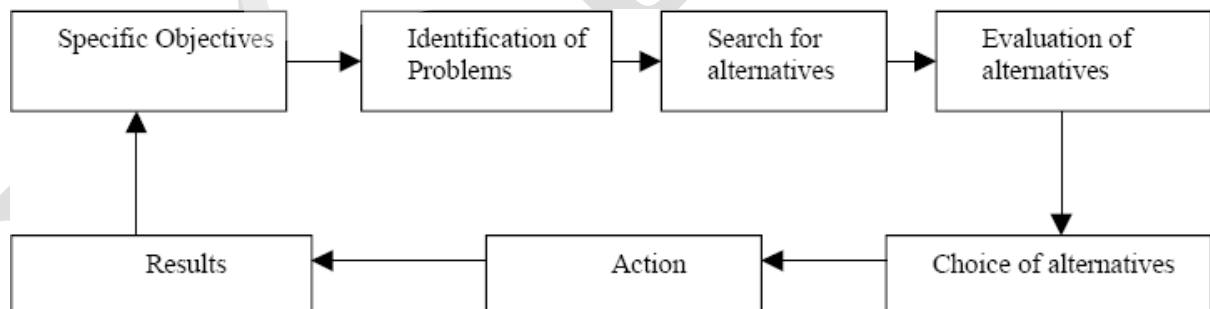
- (i) May not be enough work for certain types of customers. Hence, under employment of facilities and manpower specialized in terms of customer groups.
- (ii) Problems of co-ordination might pose difficulties.
- (iii) Unequal development of customer groups.

CHAPTER 2 – DECISION MAKING

"Decision-making is the selection based on some criteria from two or more possible alternatives".

Decision Making Process

The decision making process is presented in the figure below:



1. Specific Objective: The need for decision making arises in order to achieve certain specific objectives. The starting point in any analysis of decision making involves the determination of whether a decision needs to be made.

2. Problem Identification: A problem is a felt need, a question which needs a solution. A good decision is dependent upon the recognition of the right problem. The objective of problem identification is that if the problem is precisely and specifically identifies, it will provide a clue in finding a possible solution. A problem can be identified clearly, if managers go through diagnosis and analysis of the problem.

Diagnosis: Diagnosis is the process of identifying a problem from its signs and symptoms. A symptom is a condition or set of conditions that indicates the existence of a problem. Diagnosing the real problem implies knowing the gap between what is and what ought to be,

identifying the reasons for the gap and understanding the problem in relation to higher objectives of the organization.

Analysis: Diagnosis gives rise to analysis. Analysis of a problem requires:

- Who would make decision?
- What information would be needed?
- From where the information is available?

Analysis helps managers to gain an insight into the problem.

3. Search for Alternatives: A problem can be solved in several ways; however, all the ways cannot be equally satisfying. Therefore, the decision maker must try to find out the various alternatives available in order to get the most satisfactory result of a decision. A decision maker can use several sources for identifying alternatives:

- His own past experiences
- Practices followed by others and
- Using creative techniques.

4. Evaluation of Alternatives: After the various alternatives are identified, the next step is to evaluate them and select the one that will meet the choice criteria. /the decision maker must check proposed alternatives against limits, and if an alternative does not meet them, he can discard it. Having narrowed down the alternatives which require serious consideration, the decision maker will go for evaluating how each alternative may contribute towards the objective supposed to be achieved by implementing the decision.

5. Choice of Alternative: The evaluation of various alternatives presents a clear picture as to how each one of them contribute to the objectives under question. A comparison is made among the likely outcomes of various alternatives and the best one is chosen.

6. Action: Once the alternative is selected, it is put into action. The actual process of decision making ends with the choice of an alternative through which the objectives can be achieved.

7. Results: When the decision is put into action, it brings certain results. These results must correspond with objectives, the starting point of decision process, if good decision has been made and implemented properly. Thus, results provide indication whether decision making and its implementation is proper.

Factors affecting the decision making process

1. The decision situation – Elements of change, risk and uncertainty are common in a decision situation and recognizing and making sense of these elements are the main challenges that decision makers face

2. The decision makers – Different people approach decision making in different ways. Individuals are unique in terms of their personalities, abilities, beliefs and values. There are therefore many issues around who is involved in decision making process

3. Time – A decision is made at a particular time in a particular set of circumstances. The decision situation can change very rapidly which will affect the decision making

4. People affected by the decision – People likely to be affected will have an influence on the outcome of a decision

5. Decision criteria – The criteria that are established and used to evaluate alternative courses of action in decision making will affect the outcome of a decision.

Characteristics of Decision Making

1. Decision making implies that there are various alternatives and the most desirable alternative is chosen to solve the problem or to arrive at expected results. It implies **choice**

2. Decision making is **continuous** and a dynamic process.

3. It **involves inbuilt risk and uncertainty** as it relates to the future
4. It is a **time consuming activity** as various aspects need careful consideration and various steps are required to be followed.
5. Decision-making is **goal-oriented**.

Importance of decision making

1. Better utilization of resources
2. Helps to face challenges and problems effectively
3. Helps to achieve objectives
4. Increases efficiency
5. Facilitates innovation

Limitations of decision making

1. Time consuming
2. Compromised decisions
3. Biased Decision
4. Limited analysis
5. Uncertain future

Types of Decisions

a) Programmed and Non-Programmed Decisions:

i) Programmed decisions: Programmed decisions are routine and repetitive and are made within the framework of organizational policies and rules. These policies and rules are established well in advance to solve recurring problems in the organization. Programmed decisions have short-run impact. They are, generally, taken at the lower level of management.

ii) Non-Programmed Decisions: Non-programmed decisions are decisions taken to meet non-repetitive problems. Non-programmed decisions are relevant for solving unique/ unusual problems in which various alternatives cannot be decided in advance. A common feature of non-programmed decisions is that they are novel and non-recurring and therefore, readymade solutions are not available. Since these decisions are of high importance and have long-term consequences, they are made by top level management.

b) Strategic, Tactical and Operational Decisions: Organizational decisions may also be classified as strategic or tactical.

i) Strategic Decisions: Basic decisions or strategic decisions are decisions which are of crucial importance. Strategic decisions a major choice of actions concerning allocation of resources and contribution to the achievement of organizational objectives. Decisions like plant location, product diversification, entering into new markets, selection of channels of distribution, capital expenditure etc are examples of basic or strategic decisions.

ii) Tactical Decisions: Routine decisions or tactical decisions are decisions which are routine and repetitive. They are derived out of strategic decisions. The various features of a tactical decision are as follows:

- Tactical decision relates to day-to-day operation of the organization and has to be taken very frequently.

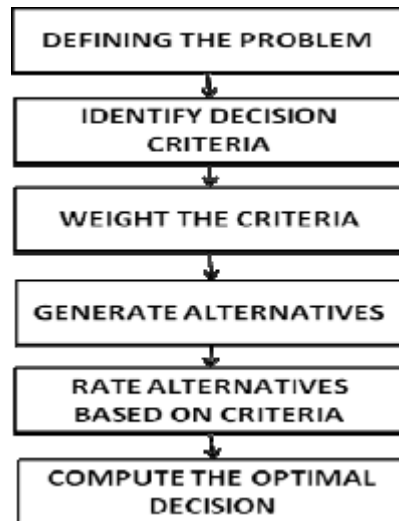
- Tactical decision is mostly a programmed one. Therefore, the decision can be made within the context of these variables.
- The outcome of tactical decision is of short-term nature and affects a narrow part of the organization.
- The authority for making tactical decisions can be delegated to lower level managers because: first, the impact of tactical decision is narrow and of short-term nature and Second, by delegating authority for such decisions to lower-level managers, higher level managers are free to devote more time on strategic decisions.

iii) Operational decisions: These are day to day decisions made by junior managers that are simple and routine. This could involve the regular ordering of supplies or the creation of a staff rota. They are decisions regarding the day-to-day functions of a business. These decisions are considered operational decisions and they are subordinate to strategic and tactical decisions. While these decisions are the responsibility of low-level managers, good decision making is crucial here since such decisions focus on productivity, quality control and employee performance. Moreover, operational decisions can be broken down into:

- Short term planning needs like ordering supplies, establishing work priorities and enlisting temporary help
- Medium term planning like hiring and firing personnel, purchasing equipment, training individuals and modifying procedures
- Long term planning like replacing subcontractors, redesigning production facilities and modifying capacity

Rational Decision Making model

The process is one that is logical and follows the orderly path from problem identification through solution. It provides a structured and sequenced approach to decision making. Using such an approach can help to ensure discipline and consistency is built into your decision making process.



The Six-Step Rational Decision-Making Model

1. Define the problem.
2. Identify decision criteria
3. Weight the criteria
4. Generate alternatives
5. Rate each alternative on each criterion
6. Compute the optimal decision

1) Defining the problem

This is the initial step of the rational decision making process. First the problem is identified and then defined to get a clear view of the situation.

2) Identify decision criteria

Once a decision maker has defined the problem, he or she needs to identify the decision criteria that will be important in solving the problem. In this step, the decision maker is determining what's relevant in making the decision. This step brings the decision maker's interests, values, and personal preferences into the process.

Identifying criteria is important because what one person thinks is relevant, another may not. Also keep in mind that any factors not identified in this step are considered as irrelevant to the decision maker.

3) Weight the criteria

The decision-maker weights the previously identified criteria in order to give them correct priority in the decision.

4) Generate alternatives

The decision maker generates possible alternatives that could succeed in resolving the problem. No attempt is made in this step to appraise these alternatives, only to list them.

5) Rate each alternative on each criterion

The decision maker must critically analyze and evaluate each one. The strengths and weakness of each alternative become evident as they compared with the criteria and weights established in second and third steps.

6) Compute the optimal decision

Evaluating each alternative against the weighted criteria and selecting the alternative with the highest total score.

Decision making under various circumstances

The conditions for making decisions can be divided into three types. Namely a) Certainty, b) Risk and c) Uncertainty

Decision Making under Certainty

In this environment, the decision maker knows with certainty the consequences of selecting every course of action or decision choice. In this type of decision problems the decision maker presumes that only one state of nature is relevant for his purposes. He identifies this state of nature, takes it for granted and presumes complete knowledge as to its occurrence. For example, suppose a person has Rs 5,00,000 to invest for a one year period. One alternate is to open a savings account paying 4% interest and another is to invest in a government treasury paying 9% interest. If both investments are secure and guaranteed, then there is a certainty that the treasury note will be the better investment.

The various techniques for solving problems under certainty are i) System of equations ii) Linear programming iii) Inventory models iv) Break even analysis

Decision Making under Risk

The future conditions are not always made in advance. In real life most managerial decisions are made under risk decisions, that is, some information is available but it is insufficient to answer all the questions about the outcome. So a decision maker has to make probability estimates of these outcomes. In decision making under **risk** one assumes that there exist a number of possible future states of nature. Each has a known (or assumed) probability of occurring, and there may not be one future state that results in the best outcome for all alternatives

Examples of future states and their probabilities are as follows:

- Alternative weather (weather) will affect the profitability of alternative construction schedules; here, the probabilities of rain and of good weather can be estimated from historical data.

Important methods of decision making under risk include:

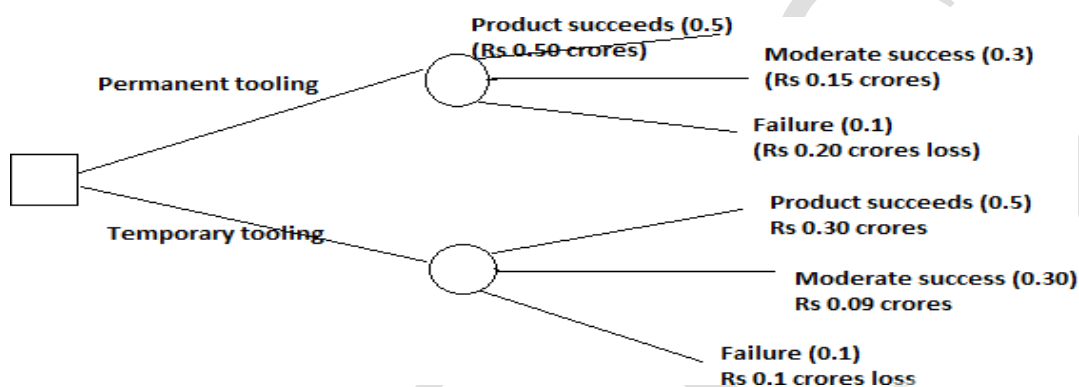
Decision trees

Some decisions involve a series of steps, the second step depending on the outcome of the first, the third depending on the outcome of the second and so on. Often uncertainty surrounds each step, so the decision maker faces uncertainty piled on uncertainty. Decision trees are a model for solving such a problem.

Decision tree is a graphical method for identifying alternate actions, estimating probabilities, and indicating the resulting expected payoff. This graphical form visually helps the decision maker view his alternatives and outcomes. Instead of compressing all the information regarding a complex decision into a table, decision maker can draw a schematic representation of the problem that displays the information in more easily understandable fashion.

Example of the problems which can be solved through decision tree may be when a new product is to be introduced, whether to tool up for tool up for it in a major way as to assure production at the lowest possible cost or to undertake cheaper temporary tooling involving a higher manufacturing cost but lower capital losses if the product does not sell well as estimated etc.

Here the second step of decision, that is, going for major or minor tooling, depends on the outcome of the first decision, that is, whether to go for new product or not. Similarly within the major tooling, there may be alternatives which can be considered in the light of decision made of tooling.



Squares represent decisions you can make. The lines that come out of each square on its right show all the available distinct options that can be selected at that decision analysis point. Circles show various circumstances that have uncertain outcomes (For example, some types of events that may affect you on a given path). The lines that come out of each circle denote possible outcomes of that uncontrollable circumstance.

Decision Making under Uncertainty

At times a decision maker cannot assess the probability of occurrence for the various states of nature. Uncertainty occurs when there exist several (i.e., more than one) future states of nature but the probabilities of each of these states occurring are not known. In such situations the decision maker can choose among several possible approaches for making the decision. A different kind of logic is used here, based on attitudes toward risk. Such situations arise when a new product is introduced in the market or a new plant is set up.

Following choices are available before the decision maker in situations of uncertainty - Maximax, Minimax, Maximin, Laplace and Hurwicz Alpha criteria.

Maximax Decision Criterion

The term Maximax is the abbreviation of the phrase maximum of the maxima. It is also called the criterion of optimism. An adventurous and aggressive decision maker chooses that act that

would result in the maximum payoff possible . Suppose for each act there are three possible payoffs,corresponding to three states of nature as given in the following decision matrix

Payoff Table

Acts	States of nature		
	S1	S2	S3
A1	220	160	140
A2	180	190	170
A3	100	180	200

The maximum of these three maximums is 220 which relates to A1. Consequently, according to the maximax criteria, the decision is to choose A1.

Minimax Decision Criterion

Minimax is just opposite to maximax. Application of the minimax criterion requires a table of losses instead of gains The losses are the costs to be incurred or the damages to be suffered for each of the alternative act and states of nature. The minimax rule minimizes the maximum possible loss for a course of action. The term minimax is an abbreviation of the phrase minimum of maxima loss. Under each of the various acts, there is a maximum loss and the act that is associated with the minimum of the various maximum losses is the act to be undertaken according to the minimax criterion. Suppose the loss table is

Opportunity loss table

Acts	States of nature		
	S1	S2	S3
A1	0	3	18
A2	4	0	14
A3	10	6	0

Maximum losses incurred by the various decisions. And the minimum among these three maximums is 0 which is offered by A3. According to Minimax criteria, the decision maker should take A3.

Maximin decision criterion (criterion of Pessimism)

The maximin criterion of decision making stands for choice between alternative courses of action assuming pessimistic view. Taking each act in turn, we note the worst possible results in terms of pay off and select the act which maximizes the minimum pay off.

Suppose the pay off table is

Payoff table

Acts	States of nature			
	S1	S2	S3	S4
A1	-80	-30	30	75
A2	-60	-10	15	80
A3	-20	-2	7	25

Minima under each decision A1 = -80, A2 = -60, A3 = -20. According to Maximin criterion, A3 is to be chosen, which gives maximum pay off among minima.

Laplace criterion

As the decision maker has no information about the probability of occurrence of various events, the decision maker makes a simple assumption that each probability is equally likely. The expected Pay off is worked out on the basis of these probabilities. Then act having maximum expected pay off is selected.

Acts	States of nature		
	S1	S2	S3
A1	20	25	30
A2	12	15	20
A3	25	30	22

We associate equal probability for each event – 1/3 to each state of nature. So, as per Laplace criterion, expected pay off are

$$A1 = 20 \times \frac{1}{3} + 25 \times \frac{1}{3} + 30 \times \frac{1}{3} = 25$$

$$A2 = 12 \times \frac{1}{3} + 15 \times \frac{1}{3} + 20 \times \frac{1}{3} = 15.67$$

$$A3 = 25 \times \frac{1}{3} + 30 \times \frac{1}{3} + 22 \times \frac{1}{3} = 25.67$$

Since A3 has maximum expected pay off, as per Laplace criterion, A3 is the Act to be selected.

Hurwicz Alpha criterion

This method is a combination of maximin criterion and minimax criterion. In this method, the decision maker's degree of optimism is represented by alpha -the coefficient of optimism. Alpha varies between 0 and 1. When alpha is = 0, there is total pessimism and when alpha is =1, there is total optimism. As per the criterion, Hurwicz value is calculated for each Act, considering maximum pay off and minimum pay off as per an Act. Hurwicz value is the total of products of maximum payoff and alpha, and minimum pay off and 1 – alpha.

Hurwicz value = Max pay off x alpha + mini pay off x 1- alpha for an Act.

Consider following pay off table. Hurwicz alpha value given is = .6

Acts	Payoff table		
	States of nature		
	S1	S2	S3
A1	20	25	30
A2	12	15	20
A3	25	30	22

$$\text{Hurwicz value for A1} = 30 \times .6 + 20 \times .4 = 26$$

$$\text{Hurwicz value for A2} = 20 \times .6 + 12 \times .4 = 16.8$$

$$\text{Hurwicz value for A3} = 30 \times .6 + 22 \times .4 = 26.8$$

Since Hurwicz value is maximum for A3, it is the optimal Act. It is to be chosen.

Creative Process and Innovation

The term creativity refers to the ability and power to develop new ideas. Innovation means the use of these ideas.

The Creative Process:

- 1. Unconscious scanning** – This scanning requires an absorption in the problem, which may be vague in the mind.
- 2. Intuition** – It connects unconscious with the conscious. This stage may involve a combination of factors that may seem contradictory at first. Intuition requires that people find new combinations and integrate diverse concepts and ideas.
- 3. Insight** – It is mostly the result of hard work. Insight may come at times when the thoughts are not directly focused on the problem at hand.

4. Logical formulation – it is the verification stage. Insight needs to be tested through logic or experiment.

Brainstorming

One of the best known techniques for facilitating creativity was developed by Alex F Osborn. Brainstorming is the name given to a situation when a group of people meet to generate new ideas around a specific area of interest. Using rules which remove inhibitions, people are able to think more freely and move into new areas of thought and so create numerous new ideas and solutions. The participants shout out ideas as they occur to them and then build on the ideas raised by others. All the ideas are noted down and are not criticized. Only when the brainstorming session is over are the ideas evaluated.

The rules of brainstorming are:

1. No ideas are ever criticized
2. The more radical the ideas, the better
3. The quantity of idea production is stressed
4. The improvement of ideas by others is encouraged

Brainstorming process:

1. Define and agree the objective.
2. Brainstorm ideas and suggestions having agreed a time limit.
3. Categorise/condense/combine/refine.
4. Assess/analyse effects or results.
5. Prioritise options/rank list as appropriate.
6. Agree action and timescale.
7. Control and monitor follow-up

ANCIER

MODULE 5

STAFFING AND RELATED HRD FUNCTIONS

CHAPTER 1 – STAFFING

Staffing involves filling the positions needed in the organization structure by appointing competent and qualified persons for the job.

Authority

Authority implies the right to command and the power to act. Authority is the right to give orders to subordinates, right to make decisions, and right to control subordinates.

Types of authority

1. Line authority – It is given to line managers to achieve the objectives of the organization
2. Staff authority – It is given to staff managers to give advice and service to the line managers
3. Functional authority – it is the right delegated to an individual or a department to control specified processes, policies or other matters relating to the activities undertaken by persons in the other departments. Eg. Production manager is given line authority in production department. However functional authority may be given for a particular department or full organization. So functional authority is not restricted to a particular department.

Responsibility

It is the work assigned to a position. Responsibility is the assignment of duties by the executive to the subordinates, which the subordinate is expected to perform. This now becomes the responsibility of the subordinate to complete the task given to him by the executive.

Empowerment

Empowerment means that employees, managers, or teams at all levels in the organization are given the power to make decisions without asking their superiors for permission. Empowerment of subordinates means that superiors have to share their authority and power with the subordinates. This participation raises self esteem. It enhances the sense of belonging and worth and increases their productivity.

Delegation

A manager alone cannot perform all the tasks assigned to him. In order to meet the targets, the manager should delegate authority. Delegation of Authority means division of authority and powers downwards to the subordinate. Delegation is about entrusting someone else to do parts of your job. Delegation of authority can be defined as subdivision and suballocation of powers to the subordinates in order to achieve effective results.

Centralisation

It is the process of transferring and assigning decision-making authority to higher levels of an organizational hierarchy. The span of control of top managers is relatively broad, and there are relatively many tiers in the organization.

Characteristics

- **Philosophy / emphasis on:** top-down control, leadership, vision, strategy.
- **Decision-making:** strong, authoritarian, visionary, charismatic.
- **Organizational change:** shaped by top, vision of leader.
- **Execution:** decisive, fast, coordinated. Able to respond quickly to major issues and changes.
- **Uniformity.** Low risk of dissent or conflicts between parts of the organization.

Advantages of Centralization

- Standardisation of procedures
- Coordination of activities
- Greater efficiency
- Reduced cost

Disadvantages of Centralization

- Destroys individual initiative.
- Slows down operation
- Overburden for few

Decentralisation

It is the process of transferring and assigning decision-making authority to lower levels of an organizational hierarchy. The span of control of top managers is relatively small, and there are relatively few tiers in the organization, because there is more autonomy in the lower ranks.

Characteristics

- **Philosophy / emphasis on:** bottom-up, political, cultural and learning dynamics.
- **Decision-making:** democratic, participative, detailed.
- **Organizational change:** emerging from interactions, organizational dynamics.
- **Execution:** evolutionary, emergent. Flexible to adapt to minor issues and changes.
- **Participation, accountability.** Low risk of not-invented-here behavior.

Advantages of Decentralization

- Raise morale and promote interpersonal relationships
- Relieve from the daily administration
- Bring decision-making close to action
- Develop Second-line managers
- Promote employee's enthusiasm and coordination

Disadvantages of Decentralization

- Top-level administration may feel it would decrease their status
- Managers may not permit full and maximum utilization of highly qualified personnel
- Increased costs. It requires more managers and large staff
- It may lead to overlapping and duplication of effort

Recentralisation of authority

At times an enterprise can be said to recentralize authority – to centralize authority that was once decentralized. Recentralisation is not normally a complete reversal of decentralization, as the authority is not wholly withdrawn by the managers who made it. The process is a centralization of authority over a certain type of activity or function, wherever in the organization it is found.

Organisation culture

The attitude, traits and behaviour patterns which govern the way an individual interacts with others is termed as culture. In the same way organizations have certain values, policies, rules and guidelines which help them create an image of their own. Organisational culture is the general pattern of behaviour, shared beliefs, and values that members have in common.

Types of organizational culture

- 1. Strong organization culture** – It refers to a situation where the employees adjust well, respect the organizations policies and adhere to the guidelines. In such a culture people enjoy working and take every assignment as a new learning and try to gain as much as they can.
- 2. Weak organizational culture** – In such a culture individuals accept their responsibilities out of fear of superiors and harsh policies. The employees in such a situation do things out of compulsion.

Staffing Process



The staffing process encompasses man power planning, recruitment, selection, and training.

a) Manpower requirements:

Manpower Planning which is also called as Human Resource Planning consists of putting right number of people, right kind of people at the right place, right time, doing the right things for which they are suited for the achievement of goals of the organization. The primary function of man power planning is to analyze and evaluate the human resources available in the organization, and to determine how to obtain the kinds of personnel needed to staff positions ranging from assembly line workers to chief executives.

b) Recruitment:

Recruitment is the process of finding and attempting to attract job candidates who are capable of effectively filling job vacancies.

Job descriptions and job specifications are important in the recruiting process because they specify the nature of the job and the qualifications required of job candidates.

c) Selection:

Selecting a suitable candidate can be the biggest challenge for any organization. The success of an organization largely depends on its staff. Selection of the right candidate builds the foundation of any organization's success and helps in reducing turnovers.

d) Training and Development:

Training and Development is a planned effort to facilitate employee learning of job related behaviors in order to improve employee performance. Experts sometimes distinguish between the terms “training” and “development”; “training” denotes efforts to increase employee skills on present jobs, while “development” refers to efforts oriented toward improvements relevant to future jobs.

Human Resource Management (HRM)

Human Resource Management is a process, which consists of four main activities, namely, **acquisition, development, motivation, as well as maintenance** of human resources.

Human Resource Management is responsible for maintaining good human relations in the organisation. It is also concerned with development of individuals and achieving integration of goals of the organisation and those of the individuals.

Scope of HRM

- (i) Human Resource Planning, i.e., determining the number and kinds of personnel required to fill various positions in the organisation.
- (ii) Recruitment, selection and placement of personnel, i.e., employment function.
- (iii) Training and development of employees for their efficient performance and growth.
- (iv) Appraisal of performance of employees and taking corrective steps such as transfer from one job to another.
- (v) Motivation of workforce by providing financial incentives and avenues of promotion
- (vi) Remuneration of employees. The employees must be given sufficient wages and fringe benefits to achieve higher standard of living and to motivate them to show higher productivity.
- (vii) Social security and welfare of employees

Manpower planning

Manpower planning or Human resource planning is the systematic and continuing process of analysing an organisation's workforce requirements under changing conditions and developing personnel policies appropriate to the long term effectiveness of the organization.

Human Resource planning is the process by which a management determines how an organisation should move from its current manpower position to its desired manpower position.

Objectives of Manpower Planning

The major objectives of Human Resource Planning in an organisation are to :

- (i) ensure optimum use of human resources currently employed;
- (ii) avoid balances in the distribution and allocation of human resources;
- (iii) assess or forecast future skill requirements of the organisation's overall objectives;
- (iv) provide control measure to ensure availability of necessary resources when required;
- (v) control the cost aspect of human resources;
- (vi) formulate transfer and promotion policies

Steps in Manpower Planning

HRP involves the following steps:

1. Analysis of Organisational Plans and Objectives:

Human resource planning is a part of overall plan of organisation. Plans concerning technology, production, marketing, finance, expansion and diversification give an idea about the volume of future work activity.

2. Forecasting Demand for Human Resources: Human resource planning starts with the estimation of the number and type of personnel required at different levels and in different departments.

3. Forecasting Supply of Human Resources: One of the important areas of human resources planning is to deal with allocation of persons to different departments depending upon the work-load and requirements of the departments. While allocating manpower to different departments, care has to be taken to consider appointments based on promotions and transfers.

4. Estimating Manpower Gaps: Net human resource requirements or manpower gaps can be identified by comparing demand and supply forecasts. Such comparison will reveal either deficit or surplus of human resources in future. Deficits suggest the number of persons to be recruited from outside whereas surplus implies redundant to be redeployed or terminated. Similarly, gaps may occur in terms of knowledge, skills and aptitudes. Employees deficient in qualifications can be trained whereas employees with higher skills may be given more enriched jobs.

5. Matching Demand and Supply : It is one of the objectives of human resource planning to assess the demand for and supply of human resources and match both to know shortages and surpluses on both the side in kind and in number. This will enable the human resource department to know overstaffing or understaffing. Once the manpower gaps are identified, plans are prepared to bridge these gaps. Plans to meet the surplus manpower may be redeployment in other departments and retrenchment in consultation, with the trade unions. People may be persuaded to quit through voluntarily retirement. Deficit can be met through recruitment, selection, transfer, promotion, and training plans. Realistic plans for the procurement and development of manpower should be made after considering the macro and micro environment which affect the manpower objectives of the organisation.

Importance of Manpower Planning

1. Despite growing unemployment, there has been shortage of human resources with required skills, qualification and capabilities to carry on works. Hence the need for human resource planning.

2 Large numbers of employees, who retire, die, leave organisations, or become incapacitated because of physical or mental ailments, need to be replaced by the new employees. Human resource planning ensures smooth supply of workers without interruption.

3. Human resource planning is also essential in the face of marked rise in workforce turnover (employee turnover refers to the number of employees who leave an organisation and are replaced by new employees) which is unavoidable and even beneficial. Voluntary quits, discharges, marriages, promotions and seasonal fluctuations in business are the examples of factors leading to workforce turnover in organisations.

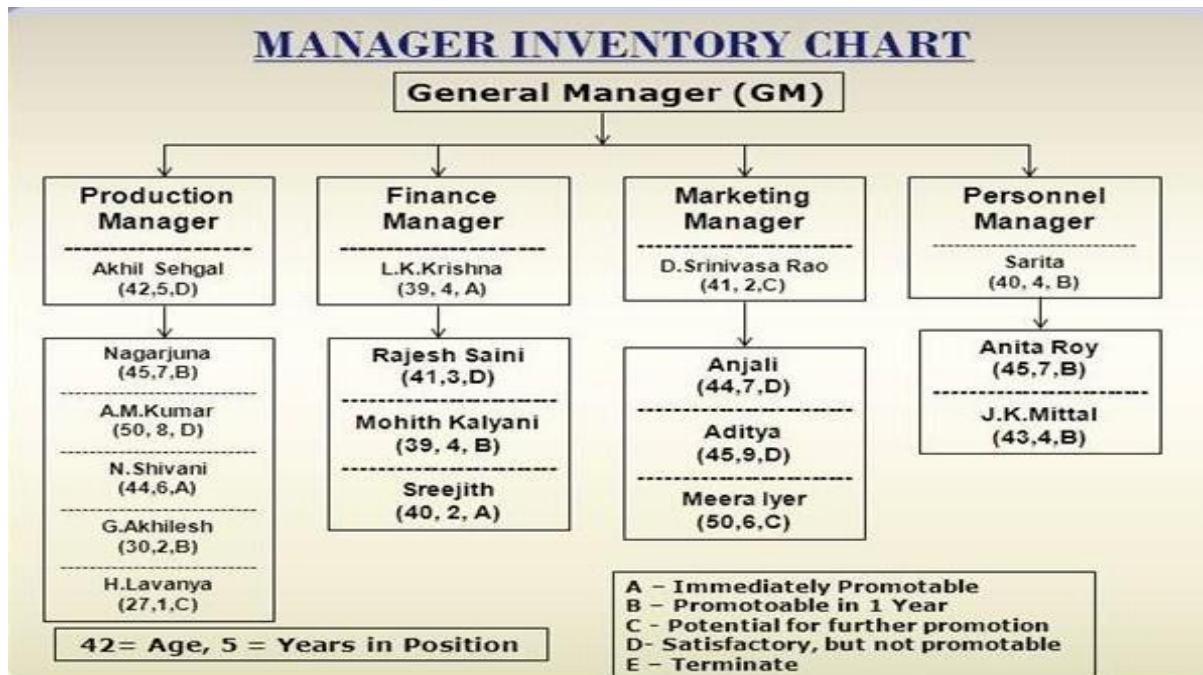
4. Technological changes and globalisation usher in change in the method of products and distribution of production and services and in management techniques. These changes may also require a change in the skills of employees, as well as change in the number of employees required. It is human resource planning that enables organisations to cope with such changes.

5. Human resource planning is also needed in order to meet the needs of expansion and diversification programmes of an organisation.

Manager Inventory Chart

Manager Inventory Chart, also known as replacement chart, is used in Replacement Planning of human resource management in an organization.

It is common for business to keep an inventory (stock) of raw materials and goods on hand to enable it to carry on its operation. In the same sense enterprises keep an inventory of available human resources, particularly managers, as competent managers are vital requirement for success. Manager inventory chart is simply an organizational chart of a unit having managerial positions being indicated and keyed with a system of promotability to each personnel.



Advantages of Manager Inventory chart

1. Clear Idea about staffing situation
2. Clear indication on future supply of managers
3. Reduces migrations or resignations
4. Identifies not performing employees and to be trained or replaced
5. Managers can be transferred from one department to another and help the weak departments

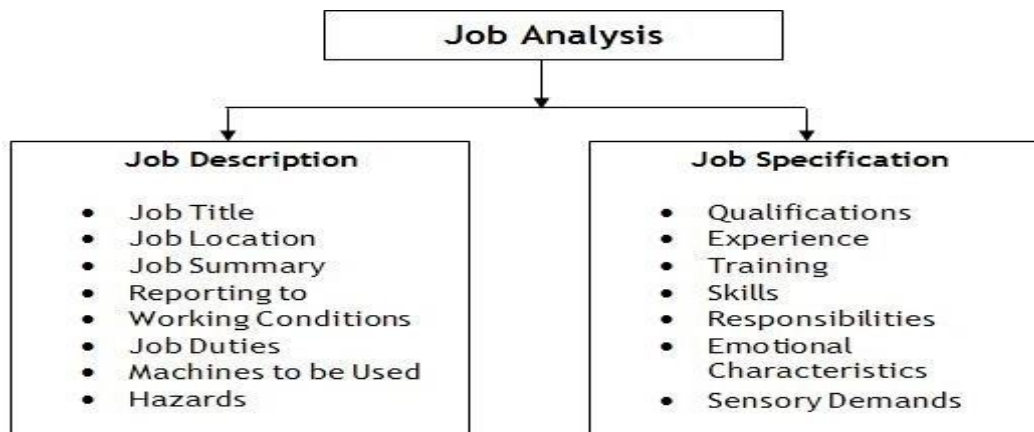
Disadvantages of Manager Inventory Chart

1. Data doesn't show to which position one may be promotable
2. Data insufficient for fair assessment of all capabilities of a person
3. Takes time and effort to keep the chart up-to-date
4. Top level managers may be reluctant to make their charts available to others

Job Analysis

Job analysis is an intensive and direct technique for identifying the essential information regarding the job. It is the process of determining the tasks involved in the job and the personnel qualities of the individuals required to perform the job.

Job analysis provides information both for the job and job holder. Job analysis is —the process of determining, by observation and study, and reporting pertinent information relating to the nature of a specific job. It is the determination of the tasks which comprise the job and of the skills, knowledge, abilities and responsibilities required of the worker for a successful performance and which differentiate one job from all others.



Job Description

The results of the job analysis are written in a statement known as job description. In other words job description is a descriptive statement of the organisational relationship, responsibilities and duties on a given job. It tells us what is to be done and how it is to be done and why.

Job Specification

The job description helps in preparing the specification for each job. So it is a product of job analysis. It is a statement of maximum acceptable human qualities necessary to perform the job satisfactorily. It is written record of the physical, mental, social, psychological and behavioural characteristics which a person should possess in order to perform the job effectively.

Job Design

Job design follows job analysis. It is a process of organizing tasks, duties and responsibilities into a unit of work to achieve organizational objectives. Job design defines the various tasks required to do a specific job and the method of performing the tasks.

While job analysis is the process that identifies tasks, duties, responsibilities, required qualifications, skills and knowledge etc for an individual for a job, job design is the allocation of tasks to an employee or group of employees in an organization.

Steps involved in job design

1. Specifying individual tasks – This means that the different tasks to be included in a job are specified and are categorized
2. Specifying methods - In this step, the specific methods to conduct the various tasks are identified. Specification of methods provides the basic guidelines to perform the job
3. Combining tasks into jobs – After specifying the individual tasks to be included in a job, they are combined into a group and assigned to individual employee or group

Importance of Job design

1. It helps the firm in achieving cost reduction by eliminating causes of accidents and injuries through enhanced safety and health measures
2. It enhances employee satisfaction, motivation, involvement and commitment levels, leading to improved cooperation between the management and employees
3. It contributes effectively to organizational effectiveness

Job evaluation

Job Evaluation is a system wherein a particular job of an enterprise is compared with its other jobs. In the present industrial era, there are different types of jobs which are performed in every business and industrial enterprise. Comparative study of these jobs is very essential because on the basis of such study the structure of wages for different types of jobs is prepared. The comparison of jobs may be made on the basis of different factors such as duties, responsibilities, working conditions, efforts, etc. In nut shell, it may be said that job evaluation is a process in which a particular job of a business and industrial enterprise is compared with other jobs of the enterprise.

Objectives of Job Evaluation

The following are the objectives of job evaluation :

- To secure and maintain complete, accurate and impersonal descriptions of each distinct job or occupation in the entire plant
- To provide a standard procedure for determining the relative worth of each job in a plant;
- To determine the rate of pay for each job which is fair and equitable with relation to other jobs in the plant, community or industry;
- To ensure that like wages are paid to all qualified employees for like work;
- To promote a fair and accurate consideration of all employees for advancement and transfer;
- To provide a factual basis for the consideration of wage rates for similar jobs in a community and industry; and
- To provide information for work organisation, employees selection, placement, training and numerous other similar problems.

Job Evaluation vs Job Analysis

Job analysis is a systematic way of gathering information about a job.

Job Evaluation begins with job analysis and ends at the determination of the worth of the job.

Methods of Job Evaluation

Ranking Method : Jobs are arranged from the highest to the lowest, in order of their values or merit in the organisation. Job at the top has the highest value and job at the lowest has the lowest value. Jobs are arranged in each department and then department rankings are combined to develop an organisational ranking.

Sr No	Rank	Monthly salaries
1	Accountant	30000
2	Accounts clerk	18000
3	Purchase assistant	17000
4	Machine operator	14000
5	Typist	9000
6	Office boy	6000

Job Grading or Job Classification Method : This method works by assigning each job a grade, level or class that corresponds to a pay grade for instance Grade I, Grade II, Grade III and so forth. These grades or classifications are created by identifying gradations of some common denominations, such as job responsibility, skill, knowledge, education required, and

so on. Then, for each job grade so created standard job descriptions are determined. Thereafter, such standard description is matched with job descriptions in the organisation.

Class	Rank	Employees
Class 1	Executives	Office manager, deputy manager
Class 2	Skilled workers	Purchase assistant, cashier
Class 3	Semi skilled workers	Typist, Machine operators
Class 4	Less skilled workers	File clerks, Office boys

Factor-comparison Method : This method is a combination of ranking and point systems. All jobs are compared to each other for the purpose of determining their relative importance by selecting four or five major job elements or factors which are more or less common to all jobs. These elements are not predetermined. These are chosen on the basis of job analysis. The few factors which are customarily used are : (i) mental requirements (ii) skill (iii) physical requirements (iv) responsibilities (v) working conditions, etc.

Job	Daily wage	Physical effort	Mental effort	Skill	Responsibility	Working condition
Electrician	60	11(3)	14(1)	15(1)	12(1)	8(2)
Fitter	50	14(1)	10(2)	9(2)	8(2)	9(1)
Welder	40	12(2)	7(3)	8(3)	7(3)	6(3)
Cleaner	30	9(4)	6(4)	4(5)	6(4)	5(4)
Labourer	25	8(5)	4(5)	6(4)	3(5)	4(5)

Suppose the job of a painter is found to be similar to electrician in skill (15), fitter in mental effort (10), welder in physical effort (12), cleaner in his responsibility (6) and labourer in working conditions (4). The wage rate for this job would be (15+10+12+6+4) is 47.

Skills Required by Managers

Refer Module 1

Personal characteristics needed by Managers

1. Desire to manage – The successful manager has a strong desire to manage, to influence others, to get results through team effort of subordinates.
2. Communication skill and empathy
3. Integrity and honesty
4. Past performance as a manager

Recruitment of employees

Recruitment means search of the prospective employee to suit the job requirements as represented by job specification—a technique of job analysis. It is the first stage in selection which makes the vacancies known to a large number of people and the opportunities that the

organisation offers. In response to this knowledge, potential applicants would write to the organisation. The process of attracting people to apply is called recruitment.

Sources of recruitment

The various sources of recruitment are generally classified as internal source and external source.

- **Internal Sources :** This refers to the recruitment from within the company. The various internal sources are promotion, transfer, past employees and internal advertisements.
- **External Sources :** External sources refers to the practice of getting suitable persons from outside. External sources include recruitment agencies, newspaper and media advertisement, campus recruitment etc

Recruitment process

a) Identification of vacancy:

The recruitment process begins with the human resource department receiving requisitions for recruitment from any department of the company. These contain:

- Posts to be filled
- Number of persons
- Duties to be performed
- Qualifications required

b) Preparation of job description and job specification:

A job description is a list of the general tasks, or functions, and responsibilities of a position. It may often include to whom the position reports, specifications such as the qualifications or skills needed by the person in the job, or a salary range. A job specification describes the knowledge, skills, education, experience, and abilities you believe are essential to performing a particular job.

c) Selection of sources:

Every organization has the option of choosing the candidates for its recruitment processes from two kinds of sources: internal and external sources. The sources within the organization itself (like transfer of employees from one department to other, promotions) to fill a position are known as the internal sources of recruitment. Recruitment candidates from all the other sources (like outsourcing agencies etc.) are known as the external sources of the recruitment.

d) Advertising the vacancy:

After choosing the appropriate sources, the vacancy is communicated to the candidates by means of a suitable media such as television, radio, newspaper, internet, direct mail etc.

e) Managing the response:

After receiving an adequate number of responses from job seekers, the sieving process of the resumes begins. This is a very essential step of the recruitment selection process, because selecting the correct resumes that match the job profile, is very important. Naturally, it has to be done rather competently by a person who understands all the responsibilities associated with the designation in its entirety. Candidates with the given skill set are then chosen and further called for interview. Also, the applications of candidates that do not match the present nature of the position but may be considered for future requirements are filed separately and preserved.

The recruitment process is immediately followed by the selection process.

Selection

The selection process begins with the job specification. The more clearly and precisely it is done the less would be the number of qualified applicants. Suppose the purpose is to select management trainees. If the qualification prescribed is MBA, the number of applicants may be in hundred. If the qualification is graduation in any discipline, the number of applicants may be in thousand.

Selection Process

a) Initial Screening

This is generally the starting point of any employee selection process. Initial Screening eliminates unqualified applicants and helps save time. Applications received from various sources are scrutinized and irrelevant ones are discarded.

b) Preliminary Interview

It is used to eliminate those candidates who do not meet the minimum eligibility criteria laid down by the organization. The skills, academic and family background, competencies and interests of the candidate are examined during preliminary interview. Preliminary interviews are less formalized and planned than the final interviews. The candidates are given a brief up about the company and the job profile; and it is also examined how much the candidate knows about the company. Preliminary interviews are also called screening interviews.

c) Filling Application Form

An candidate who passes the preliminary interview and is found to be eligible for the job is asked to fill in a formal application form. Such a form is designed in a way that it records the personal as well professional details of the candidates such as age, qualifications, reason for leaving previous job, experience, etc.

d) Personal Interview

Most employers believe that the personal interview is very important. It helps them in obtaining more information about the prospective employee. It also helps them in interacting with the candidate and judging his communication abilities, his ease of handling pressure etc. In some Companies, the selection process comprises only of the Interview.

e) References check

Most application forms include a section that requires prospective candidates to put down names of a few references. References can be classified into - former employer, former customers, business references, reputable persons. Such references are contacted to get a feedback on the person in question including his behaviour, skills, conduct etc.

f) Background Verification

A background check is a review of a person's commercial, criminal and (occasionally) financial records. Employers often perform background checks on employers or candidates for employment to confirm information given in a job application, verify a person's identity, or ensure that the individual does not have a history of criminal activity, etc., that could be an issue

upon employment.

g) Final Interview

Final interview is a process in which a potential employee is evaluated by an employer for prospective employment in their organization. During this process, the employer hopes to determine whether or not the applicant is suitable for the job. Different types of tests are conducted to evaluate the capabilities of an applicant, his behaviour, special qualities etc. Separate tests are conducted for various types of jobs.

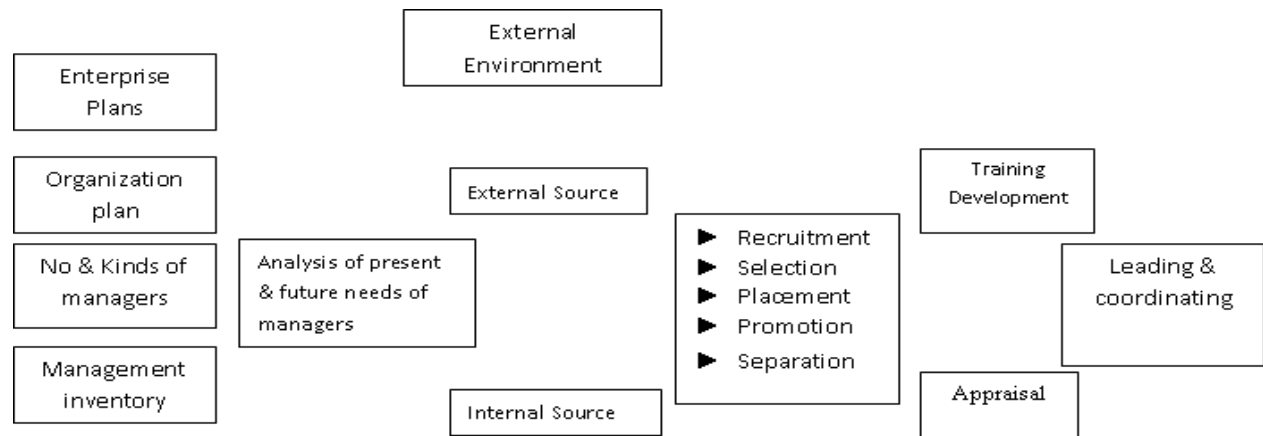
h) Physical Examination

If all goes well, then at this stage, a physical examination is conducted to make sure that the candidate has sound health and does not suffer from any serious ailment.

i) Job Offer

A candidate who clears all the steps is finally considered right for a particular job and is presented with the job offer. An applicant can be dropped at any given stage if considered unfit for the job.

Systems approach to selection



Above figure shows that the staffing is the management function relates to the total management system. The enterprise plans (planning) become the basic for organization plans (organizing) that are necessary to achieve enterprise objectives. The staff selected, will perform its functions under the supervision of first two aforesaid plans.

Techniques and instruments used for selection

1. Tests: A test is a sample of an aspect of an individual's behaviour, performance or attitude. It also provides a systematic basis for comparing the behaviour, performance or attitude of two or more persons. Tests serve as a screening device and provide supplementary inputs in selection decisions. Their value lies in the fact that they serve additional predictors intended to make selection decision more apt and accurate.

Intelligence Tests: These are tests to measure one's intellect or qualities of understanding. They are also referred to as tests of mental ability. The traits of intelligence measured include: reasoning, verbal and non-verbal fluency, comprehension, numerical, memory and spatial relations ability.

Aptitude Tests: Aptitude refers to one's natural propensity or talent or ability to acquire a particular skill. While intelligence is a general trait, aptitude refers to a more specific capacity or potential. It could relate to mechanical dexterity, clerical, linguistic, musical academic etc.

Achievement Tests: These are proficiency tests to measure one's skill or acquired knowledge. The paper and pencil tests may seek to test a person's knowledge about a particular subject.

PIP Tests : PIP tests are those which seek to measure one's personality, interest and preferences. These tests are designed to understand the relationship between any one of these and certain types of jobs.

Projective Tests : These tests expect the candidates to interpret problems or situations. Responses to stimuli will be based on the individual's values, beliefs and motives.

2. Interview: Interview is an oral examination of candidates for employment. No selection process is complete without one or more interviews. Interview is the most common and core method of both obtaining information from job-seekers, and decision-making on their suitability or otherwise

Placement

When a person has been finally selected for a job, the selection process still does not end. The last act in the selection process is the placement of the person into his new job and orientation in to the organizational environment.

Placement is the process of fitting the selected person at the right job or place. A worker should be placed on a position where there is full use of his strengths and all his weaknesses become irrelevant.

Orientation

Orientation or induction is the process of introducing new employees to an organization, to their specific jobs & departments, and in some instances, to their community.

Purposes of Orientation

1. To Reduce Startup-Costs:

Proper orientation can help the employee get "up to speed" much more quickly, thereby reducing the costs associated with learning the job.

2. To Reduce Anxiety:

Any employee, when put into a new, strange situation, will experience anxiety that can impede his or her ability to learn to do the job. Proper orientation helps to reduce anxiety.

3. To Reduce Employee Turnover:

Employee turnover increases as employees feel they are not valued, or are put in positions where they can't possibly do their jobs. Orientation shows that the organization values the employee, and helps provide tools necessary for succeeding in the job.

4. To Save Time for Supervisor & Co-Workers:

Simply put, the better the initial orientation, the less likely supervisors and co-workers will have to spend time teaching the employee.

5. To Develop Realistic Job Expectations, Positive Attitudes and Job Satisfaction

Training and development

Training is an organised activity for **increasing the knowledge and skills of people for a definite purpose.**

Purpose of Training:

1) To improve Productivity: Training leads to increased operational productivity and increased company profit.

2) To improve Quality: Better trained workers are less likely to make operational mistakes.

3) To improve Organizational Climate: Training leads to improved production and product quality which enhances financial incentives. This in turn increases the overall morale of the organization.

4) To increase Health and Safety: Proper training prevents industrial accidents.

5) Personal Growth: Training gives employees a wider awareness, an enlarged skill base and that leads to enhanced personal growth.

Steps in Training Process

1) Identifying Training needs: A training program is designed to assist in providing solutions for specific operational problems or to improve performance of a trainee.

- Organizational determination and Analysis: Allocation of resources that relate to organizational goal.
- Operational Analysis: Determination of a specific employee behaviour required for a particular task.
- Man Analysis: Knowledge, attitude and skill one must possess for attainment of organizational objectives

2) Getting ready for the job: The trainer has to be prepared for the job. And also who needs to be trained - the newcomer or the existing employee or the supervisory staff.

Preparation of the learner:

- Putting the learner at ease
- Stating the importance and ingredients of the job
- Creating interest
- Placing the learner as close to his normal working position
- Familiarizing him with the equipment, materials and trade terms

3) Presentation of Operation and Knowledge: The trainer should clearly tell, show, illustrate and question in order to convey the new knowledge and operations. The trainee should be encouraged to ask questions in order to indicate that he really knows and understands the job.

4) Performance Try out: The trainee is asked to go through the job several times. This gradually builds up his skill, speed and confidence.

5) Follow-up: This evaluates the effectiveness of the entire training effort

Training methods

Training methods can be broadly classified as on-the-job training and off-the-job training

a) On-the-job training

On the job training occurs when workers pick up skills whilst working along side experienced workers at their place of work. For example this could be the actual assembly line or offices where the employee works. New workers may simply “**shadow**” or observe fellow employees to begin with and are often given instruction manuals or interactive training programmes to work through.

b) Off-the-job training

This occurs when workers are **taken away from their place of work** to be trained. This may take place at training agency or local college, although many larger firms also have their own training centres. Training can take the form of lectures or self-study and can be used to develop more general skills and knowledge that can be used in a variety of situations.

Merit Rating

Merit rating is a technique to evaluate the merits of duals according to job request merit. The personal abilities that an individual brings to his job, measured by the extent to which his output or quality of his work exceeds the minimum that can reasonably be expected for his basic rate of pay.

Merit rating is a process through which the ability, efficiency and the potentiality of an employee are evaluated for the purpose of determining wage rate, need of training and for determining the policy for promotions and transfers.

Methods of Merit Rating

1. Rating Procedure : In this method, the abilities of an employee are compared with that of other employees. Under this method, the employees are divided into efficient and inefficient employee. This method adopts the technique of paired comparison. Therefore, the pairs of two employees each are made according to the formula of $N(N-1)/2$ and the more efficient employee in every pair is underlined. The employee having maximum underline is treated as the most efficient employee whereas the employee having no underline to his credit, is treated least efficient employee.

2. Grading Method : Here different grades are divided for evaluating the ability of different employees and then the employees are placed in these grades. The grades are—Excellent, Very Good, Good, Average, Bad, Worst. Every grade may again be sub-divided into three grades: (i) Highly Satisfactory (ii) Satisfactory (iii) Non-satisfactory. Employees can be placed in any of these groups according to their abilities.

3. Man to Man Comparison Method : This is the method where, a master scale is used to evaluate the qualities of different employees. The five scales of performance are determined for every job in the master scale. For example, to measure the efficiency of employees, first of all the most efficient employee is selected and after that the most inefficient employees are selected who are respectively more efficient than average efficiency and less efficient than average efficiency. These five employees become the base for measuring the efficiency of the total employees. Every employee of the enterprise is compared with these five employees to evaluate their ability and efficiency.

4. Graphic Rating Method : In this method, the abilities of employees are evaluated through graph. The abilities of all the employees are represented on a graph paper with the help of scale. Following qualities are included to evaluate the ability of employees such as Quantity of Job, Quality of job, Regularity, ability to learn, ability to initiate, dependence upon other employees and officers, safety aspects, ability to direct, ability to supervise, behaviour with other employees and officers. Under this method of Merit Rating, a report is prepared regarding Merit Rating of every employees and it is represented on a graph paper. It makes evaluation of employees very easy and simple.

5. Checking List Method : A list of necessary qualities for the performance of a job is prepared under this method. The qualities of the employees are measured on the basis of the abilities of such lists. If an employee possesses that quality, the sign + is marked in the list. If that quality is not possessed by an employee the sign - is marked in the list. If there is a doubt regarding it, the sign of (?) is marked in the list. On the basis these sign, the abilities of an employee are evaluated.

Labour Welfare

Labour welfare is the efforts by the employer to provide the best conditions of employment in their industries. It entails all those activities of employer directed towards providing the employees with certain facilities and services in addition to wages or salaries. It includes monitoring of working conditions, creation of industrial harmony through infrastructure for health, industrial relations and insurance against disease, accident and unemployment for the workers and their families. Labour welfare activities motivates the workers, improves the

morale of workers, helps to have better employee-employer relations and increase the productivity of the industry.

Methods of labour welfare

1. Economic welfare measures – It consists of giving health services and first aid, providing pension scheme, giving loans at reduced rates of interest etc to employees by employers
2. Facilitates welfare – It consists of measures of providing facilities in addition to basic economic welfare such as transportation facilities, canteen facility, housing, rest rooms, educational facilities, etc
3. Recreational welfare measures – It consists of sports, games, social get-togethers, cultural programmes etc.

Industrial Discipline

Discipline means to behave in accordance with the rules, regulations, and orders defined by the management. It can be positive discipline or negative discipline. Positive discipline controls employees without force. Negative discipline control employees by force.

Industrial Disputes

Industrial Disputes Act 1947 defines any dispute or difference between employers and employers or between employers and workers, or between workers and workers, which is connected with the employment or non-employment or terms of employment or with the conditions of labour of any person.

Causes of Industrial Disputes

- 1) **Wages and Allowances:** The most important cause for disputes relates to wages. The demand for increase in wages and allowances is the most important cause of industrial disputes. The demand for wages and allowances has never been fully met because of inflation and high cost of living.
- 2) **Union Rivalry:** Most organizations have multiple unions. Multiplicity of unions leads to interunion rivalries. If one union agrees to a wage settlement, another union will oppose it.
- 3) **Managerial Causes:** These causes include autocratic managerial attitude and defective labour policies. In this includes failures of recognize the trade union, defective recruitment policies, irregular layoff and retrenchment, defiance of agreements and codes, defective leadership, weak trade unions.

Settlement of industrial disputes

1) **Arbitration:** it is a procedure in which a neutral third party studies the bargaining situation listen to both the parties and gathers information and then make recommendation that are binding the parties.

2) **Conciliation:** It is a process by which representatives of workers and employees are brought together before a third party with a view to persuading them to arrive at an agreement by mutual discussion between them

3) Collective Bargaining: it is a process by which employers on the one hand and representative of the employees on the other, attempt to arrive at agreements covering the conditions under which employees will contribute and be compensated for their services.

4) Adjudication: it is means a mandatory settlement of an industrial dispute by a labour court or a tribunal. Whenever an industrial dispute remains unresolved by the conciliation officer and the board of conciliation, the matter is referred in a court of inquiry.

NCERC

MODULE 6

LEADERSHIP & CONTROLLING

NCERC



Leading

Controlling



Leadership is an integral part of management and plays a vital role in management operation. Leadership exists in any type of organization. If there is any single factor that differentiates between successful and unsuccessful organization, it could be considered as dynamic and effective leadership. It is the capacity of an individual to influence and direct group effort towards the achievement of organizational goals.

“Leadership is the ability of a manager to induce subordinates to work with confidence and zeal.”-Koontz and O'Donnell.

“Leadership is the exercise of authority and making of decisions.” -Dubin, R.

“Leadership is the ability to secure desirable actions from a group of followers voluntarily, without the use of coercion.”-Allford and Beaty.

Nature and Characteristics:

- 1- Leadership is a personal quality.
2. It exists only with followers. If there are no followers, there is no leadership.
3. It is the willingness of people to follow that makes person a leader.
4. Leadership is a process of influence. A leader must be able to influence the behaviour, attitude and beliefs of his subordinates.
5. It exists only for the realization of common goals.
6. It involves readiness to accept complete responsibility in all situations.
7. Leadership is the function of stimulating the followers to strive willingly to attain organisational objectives.
8. Leadership styles do change under different circumstances.
9. Leadership is neither bossism nor synonymous with management.

Leadership Functions:

Following are the important functions of a leader:

1. Setting Goals:

A leader is expected to perform creative function of laying out goals and policies to persuade the subordinates to work with zeal and confidence.

2. Organizing:

The second function of a leader is to create and shape the organisation on scientific lines by assigning roles appropriate to individual abilities with the view to make its various components to operate sensitively towards the achievement of enterprise goals.

3. Initiating Action:

The next function of a leader is to take the initiative in all matters of interest to the group. He should not depend upon others for decision and judgement. He should float new ideas and his decisions should reflect original thinking.

4. Co-Ordination:

A leader has to reconcile the interests of the individual members of the group with that of the organisation. He has to ensure voluntary co-operation from the group in realizing the common objectives.

5. Direction and Motivation:

It is the primary function of a leader to guide and direct his group and motivate people to do their best in the achievement of desired goals. He should build up confidence and zeal in the work group.

6. Link between Management and Workers:

A leader works as a necessary link between the management and the workers. He interprets the policies and programmes of the management to this subordinate and represent the subordinates' interests before the management. He can prove effective only when he can act as the true guardian of the interests of the subordinates.

Qualities of a Good Leader:

A successful leader secures desired behaviour from his followers. It depends upon the quality of leadership he is able to provide. A leader to be effective must possess certain basic qualities. A number of authors have mentioned different qualities which a person should possess to be a good leader.

Some of the qualities of a good leader are as follows:

1. Good personality.
2. Emotional stability.
3. Sound education and professional competence.
4. Initiatives and creative thinking.
5. Sense of purpose and responsibility.
6. Ability to guide and teach.
7. Good understanding and sound judgment.
8. Communicating skill.
9. Sociable.
10. Objective and flexible approach.
11. Honesty and integrity of character.
12. Self confidence, diligence and industry.
13. Courage to accept responsibility.

Leadership Styles or Types of Leaders:

The term 'leadership style, refers to the consistent behaviour pattern of a leader as perceived by people around him. Every leader develops a pattern in the way he handles his subordinates or followers in various situations. The leadership style is the result of the philosophy, personality and experience of the leader. It also depends upon the types of followers and the conditions prevailing in an organisation.

1. Leadership Style Based on Attitude and Behaviour:

According to their attitude and behaviour patterns leaders are classified as under:

1. Autocratic or authoritarian style leader.
2. Laissez-faire or Free-rein style leader.
3. Democratic or participative style leader.
4. Paternalistic style leader.

1. Autocratic or Authoritarian Style Leader:

An autocratic also known as authoritarian style of leadership implies yielding absolute power. Under this style, the leader expects complete obedience from his subordinates and all decision-making power is centralized in the leader. No suggestions or initiative from subordinates is entertained. The leader forces the subordinates to obey him without questioning. An autocratic leader is, in fact, no leader. He is merely the formal head of the organisation and is generally disliked by the subordinates. The style of leadership may be practiced to direct those subordinates who feel comfortable to depend completely on the leader.

2. Laissez-faire or Free-rein Style Leader:

Under this type of leadership, maximum freedom is allowed to subordinates. They are given free had in deciding their own policies and methods and to make independent decisions. The leader provides help only when required by his subordinates otherwise he does not interfere in their work. The style of leadership creates self-confidence in the workers and provides them an opportunity to develop their talents. But it may not work under all situations with all the workers and under all situations. Such leadership can be employed with success where workers are competent, sincere and self- disciplined.

3. Democratic or Participative Style Leader:

The democratic or participative style of leadership implies compromise between the two extremes of autocratic and laissez-fair style of leadership. Under this style, the supervisor acts according to the mutual consent and the decisions reached after consulting the subordinates. Subordinates are encouraged to make suggestions and take initiative.

It provides necessary motivation to the workers by ensuring their participation and acceptance of work methods. Mutual trust and confidence is also created resulting in job satisfaction and improved morale of workers. It reduces the number of complaints, employee's grievances, industrial unrest and strikes. But this style of leadership may sometimes cause delay in decisions and lead to indiscipline in workers.

4. Paternalistic Style Leader:

This style of leadership is based upon sentiments and emotions of people. A paternalistic leader is like a father to his subordinates. He looks after the subordinates like a father looks after his family. He helps guides and protects all of his subordinates but under him no one grows. The subordinates become dependent upon the leader.

II. Formal and Informal Leader:

Leadership style based on official Recognition/Relationship:

From the view point of official recognition from top management, leaders may be classified as under:

1. Formal Leader
2. Informal Leader

1. Formal Leader:

A formal leader is one who is formally appointed or elected to direct and control the activities of the subordinates. He is a person created by the formal structure, enjoys organisational authority and is accountable to those who have elected him in a formal way. The formal leader has a two-fold responsibility. On the one hand, he has to fulfill the demands of the organisation, while on the other he is also supposed to help, guide and direct his subordinates in satisfying their needs and aspirations.

2. Informal Leader:

Informal leaders are not formally recognized. They derive authority from the people who are under their influence. In any organisation we can always find some persons who command respect and who are approached to help guide and protect the interest of the people. They are known as informal leaders.

The informal leaders have only one task to perform, i.e., to help their followers in achieving their individual and group goals. Informal leaders are created to satisfy those needs which are not satisfied by the formal leaders. An organisation can make effective use of informal leaders to strengthen the formal leadership.

Transactional and Transformational Leadership

Leadership can be described as transactional or transformational. Transactional leaders focus on the role of supervision, organization, and group performance. They are concerned about the status quo and day-to-day progress toward goals. Transformational leaders work to enhance the motivation and engagement of followers by directing their behavior toward a shared vision. While transactional leadership operates within existing boundaries of processes, structures, and goals, transformational leadership challenges the current state and is change-oriented.

Transactional Leadership

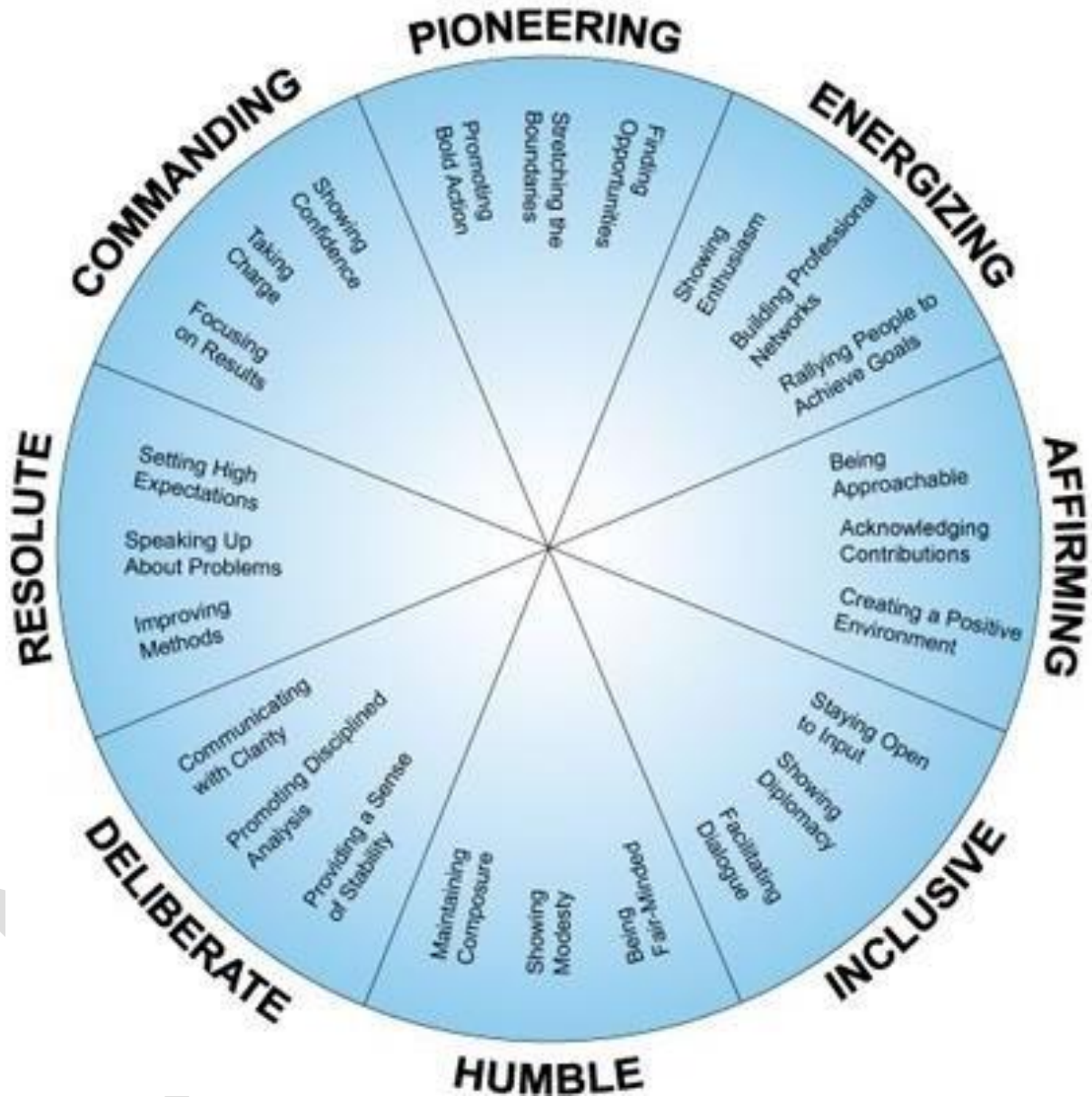
Transactional leadership promotes compliance with existing organizational goals and performance expectations through supervision and the use of rewards and punishments. Transactional leaders are task- and outcome-oriented. Especially effective under strict time and resource constraints and in highly-specified projects, this approach adheres to the status quo and employs a form of management that pays close attention to how employees perform their tasks.

Transformational Leadership

Transformational leadership focuses on increasing employee motivation and engagement and attempts to link employees' sense of self with organizational values. This leadership style emphasizes leading by example, so followers can identify with the leader's vision and values. A transformational approach focuses on individual strengths and weaknesses of employees and on enhancing their capabilities and their commitment to organizational goals, often by seeking their buy-in for decisions.

BASIS FOR COMPARISON	TRANSACTIONAL LEADERSHIP	TRANSFORMATIONAL LEADERSHIP
Meaning	A leadership style that employs rewards and punishments for motivating followers is Transactional Leadership.	A leadership style in which the leader employs charisma and enthusiasm to inspire his followers is Transformational Leadership.
Concept	Leader lays emphasis on his relation with followers.	Leader lays emphasis on the values, ideals, morals and needs of the followers.
Nature	Reactive	Proactive
Best suited for	Settled Environment	Turbulent Environment
Works for	Developing the existing organizational culture.	Changing the existing organizational culture.
Style	Bureaucratic	Charismatic
How many leaders are there in a group?	Only one	More than One
Focused on	Planning and Execution	Innovation
Motivational tool	Attracting followers by putting their own self interest in the first place.	Stimulating followers by setting group interest as a pr

Dimensions of Leadership



LEADERSHIP DIMENSION shows you which “tools” you reach for most often. When your personality profile is merged with your natural, or “default,” leadership style, you can see your LEADERSHIP DIMENSION.

While your particular leadership gifting contains strengths worth developing and weaknesses that warrant attention, a truly effective leader must be MULTIDIMENSIONAL, capable of adopting leadership strategies other than their own.

The Pioneering Dimension:

Strengths and Motivators

- Action-oriented, adventurous, and drawn to new opportunities
- Dynamic and charismatic, charming others into support
- Passionate, optimistic, confident, and creative

Challenges

- Impulsive, impatient, overconfident, and outspoken
- Aggressive and overpowering under pressure
- Inconsiderate of how their impulsiveness may affect others in their wake

PIONEERING leaders would increase their effectiveness through focusing on patience, humility and consideration in their dealings with others.

The Energizing Dimension:

Strengths and Motivators

- Enthusiastic, spontaneous, outgoing, and upbeat
- Unafraid of colorful, new ideas— generating them or embracing them
- Collaborative, open, expressive, and connected

Challenges

- Disorganized, scattered, and erratic, especially on follow-through or solitary tasks; annoyed by analysis
- Motivated to avoid negativity, both external and internal (sensitivity to criticism)
- Overly expressive and even frantic under pressure

ENERGIZING leaders would increase effectiveness through being more objective, and following through on tasks.

The Affirming Dimension

Strengths and Motivators

- Kind and supportive, seeing the good in others
- Flexible, open, patient, easy-going, and tolerant.
- Relationship-oriented, sincere, affectionate.

Challenges

- Averse to conflict, often struggling to give negative feedback or an opposing viewpoint

- Prone to avoiding difficult problems that may create tension
- Frustrated by analysis because of a perception that it is negative by nature.

AFFIRMING leaders would increase their effectiveness through acknowledging others' flaws, and by confronting problems.

The Inclusive Dimension

Strengths and Motivators

- Good listeners who foster collaboration and understanding
- Accepting, diplomatic, patient, and dependable
- Prone to adopt a cautious, methodical pace to ensure thoughtfulness

Challenges

- Passive, often allowing others to take advantage of their patient nature
- Threatened by change or the unknown
- Prone to internalizing problems and avoiding conflict

INCLUSIVE leaders would increase their effectiveness by displaying self- confidence and revealing their true feelings.

The Humble Dimension

Strengths and Motivators

- Reliable, steady, conscientious, precise, and consistent
- Fair-minded, practical, diligent, and thorough
- Able to discern what systems and structures would meet others' needs

Challenges

- Overly cautious, hindering spontaneity or creativity at times
- Wary of change or "rocking the boat," even when it may be needed
- Prone to avoid trouble, conflicts, self-expression, and exposure

HUMBLE leaders would increase their effectiveness by being decisive, showing a sense of urgency, initiating change, and speaking up.

The Deliberate Dimension

Strengths and Motivators

- Disciplined leaders who provide high-quality outcomes through careful analysis and planning
- Systematic, moderately paced, objective problem- solvers
- Accurate, valuing expertise, logic, and privacy

Challenges

- Reluctant to show emotions coupled with a distaste for vulnerability
- Stubbornly skeptic of others' ideas, particularly if it threatens their perceived sense of credibility
- Devoted to a comfort zone that can make them seem isolated or stagnant

DELIBERATE leaders would increase their effectiveness by acknowledging others' feelings and looking beyond data.

The Resolute Dimension

Strengths and Motivators

- Tenaciously driven, with a passion for overcoming obstacles
- Independent and determined, valuing personal mastery, accomplishment, and efficient results

Challenges

- Naturally skeptical, appearing disinterested, guarded, or serious
- Vigorous debaters, critical, with a disdain for weakness
- Self-reliant, opinionated, driven by a perception of “shoulds”

RESOLUTE leaders would increase their effectiveness by focusing on personal warmth, tactful communication, and attention to others' needs.

The Commanding Dimension

Strengths and Motivators

- Powerful, decisive leaders who possess a take-charge presence
- Competitive, driven, assertive, motivated by bottom-line results or victory
- Able to tenaciously tolerate conflict

Challenges

- Blunt, insistent, demanding, and with an aversion to “soft” emotions
- Forceful, pushing others at the expense of morale
- Closed to feedback, but open to giving it

COMMANDING leaders would increase their effectiveness by focusing on patience and empathy.

The eight dimensions can be briefly summarised as:

1. **Pioneering** – dynamic, charismatic, and adventurous
2. **Energising** – outgoing, encouraging, and spontaneous
3. **Affirming** – approachable, friendly, and positive
4. **Inclusive** – patient, accepting, and diplomatic
5. **Humble** – soft-spoken, precise, and modest
6. **Deliberate** – systematic, analytical, and cautious
7. **Resolute** – rational, challenging, and determined
8. **Commanding** – assertive, competitive, and driven

Trait Theory of Leadership

Trait Theory of Leadership is based on the assumption that people are born with inherited traits and some traits are particularly suited to leadership. People who make effective leaders have the right (or sufficient) combination of traits and great leaders has some common personality characteristics. Trait theories help us identify traits and dispositions that are helpful when leading others. This theory as described by Kelly (1974) attempts to classify what personal characteristics such as physical, personality and mental, are associated with leadership success. Trait theory relies on research that relates various traits to the success of a leader.

Early research on leadership was based on the psychological focus of the day, which was of people having inherited characteristics or traits. The trait theory of leadership focused on analyzing mental, physical and social characteristic in order to gain more understanding of what is the characteristic or the combination of characteristics that are common among leaders. There have been many different studies of leadership traits and attention was put on discovering these traits, often by studying successful leaders, but with the underlying assumption that if other people could also be found with these traits, then they, too, could also become great leaders.

Examples of Leadership Traits:

A lengthy list of traits has been made to describe an effective leader in terms of certain characteristics. Given below is a list of some traits/skills (non- exhaustive) generally believed to be possessed by leaders. This list is non-exhaustive as a large number of classifications exist for traits, for example Gordon Allport, an American psychologist had identified almost 18,000 English personality-relevant terms. A broad classification to six categories of traits is also done below:

Physical Characteristics of the Leader:

- Age
- Height
- Weight
- Alertness
- Energy

Background Characteristics of the Leader:

- Education
- Social Status
- Mobility
- Experience

Intelligence Characteristics of the Leader:

- Ability
- Judgment
- Knowledge
- Clever (intelligent)
- Conceptually skilled
- Creative
- Knowledgeable about group task
- Intellectual breadth

Personality Characteristics of the Leader:

- Aggressiveness
- Alertness
- Dominance
- Decisiveness
- Enthusiasm
- Extroversion
- Independence
- Self-confidence
- Authoritarianism
- Assertive
- Tolerant of stress

Task-Oriented Characteristics of the Leader:

- Achievement Needs
- Responsibility
- Initiative
- Persistence
- Ambitiousness
- Achievement-orientated
- Decisive
- Persistent
- Willingness to assume responsibility
- Organized (administrative ability)

Social Characteristics of the Leader:

- Supervisory Ability
- Popularity
- Prestige
- Tact
- Diplomacy
- Adaptability
- Cooperative
- Dependable
- Persuasive
- Socially skilled
- Emotional stability and composure
- Good interpersonal skills

Advantages of Trait Theory of Leadership:

The trait theory is naturally pleasing theory and gives constructive information about leadership. Lot of research has validated the foundation and basis of the theory and it can be applied by people at all levels in all types of organizations. Managers can utilize the information from the theory to evaluate their position in the organization and to assess how their position can be made stronger in the organization. It serves as a yardstick against which the leadership traits of an individual can be assessed and individuals can get an in-depth understanding of their identity and the way they will affect others in the organization. This theory makes the manager aware of their strengths and weaknesses and thus they get an understanding of how they can develop their leadership qualities. It gives a detailed knowledge and understanding of the leader element in the leadership process.

Criticism / Arguments against - The Trait Theory of Leadership:

Many arguments are made against the leadership theory of traits. The greatest argument is that if particular traits are key differentiator of leadership, then how do we explain people who possess these qualities but are not leaders?

Some findings point out to the fact that leaders are intelligent individuals. But they do not provide any clue as to whether leaders are brighter than their followers or are as close to them in intelligence.

The followers have a significant effect on the job accomplished by the leader. Trait theory completely ignores the followers and the situations that also help a leader to be successful. To be more objective, traits of the person as well as demand of the situation together determine the effectiveness of the leader.

Some of the personality traits are overlapping with each other. Therefore, you need to be cautious in stating, personality or any other characteristic as a cause of successful leadership.

Moreover the list of possible traits tends to be very long and personality traits measurement weren't reliable across studies. More than 100 different traits of successful leaders in various leadership positions have been identified. These descriptions are simply generalities and there exists disagreement over which traits are the most important for an effective leader. This theory does not offer explanations between the relation of each characteristic and its impact on leadership. Some of the traits may describe a successful leader but predicting successful leaders on the basis of traits alone is not a correct approach.

The Fiedler Contingency Model

The Fiedler Contingency Model was created in the mid-1960s by Fred Fiedler, a scientist who studied the personality and characteristics of leaders.

The model states that there is no one best style of leadership. Instead, a leader's effectiveness is based on the situation. This is the result of two factors – "leadership style" and "situational favorableness" (later called "situational control").

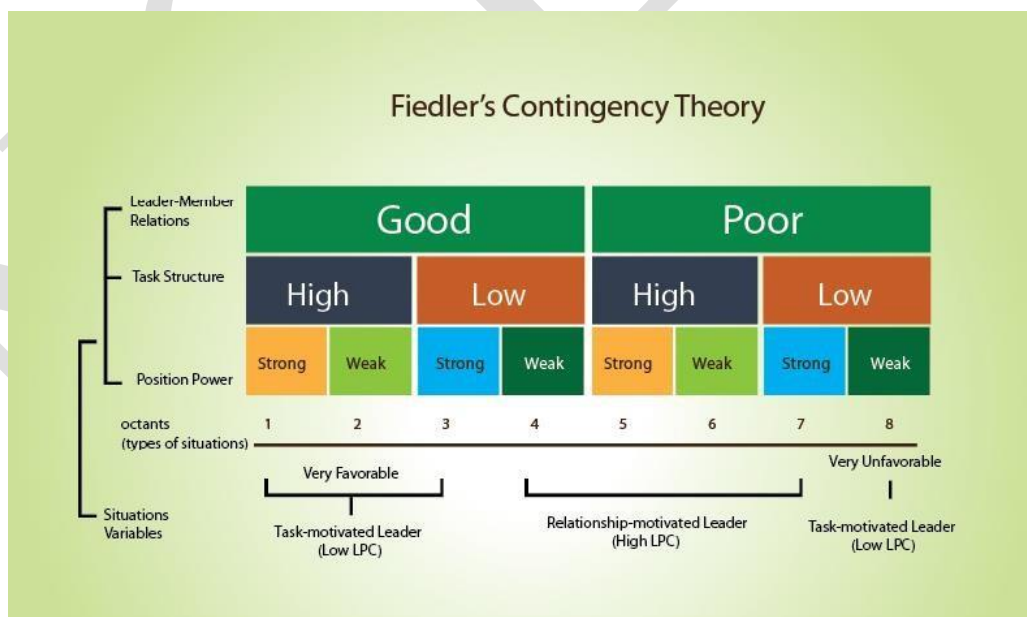
Situational Favorableness

"situational favorableness" of your particular situation depends on three distinct factors:

Leader-Member Relations – This is the level of trust and confidence that your team has in you. A leader who is more trusted and has more influence with the group is in a more favorable situation than a leader who is not trusted.

Task Structure – This refers to the type of task you're doing: clear and structured, or vague and unstructured. Unstructured tasks, or tasks where the team and leader have little knowledge of how to achieve them, are viewed unfavorably.

Leader's Position Power – This is the amount of power you have to direct the group, and provide reward or punishment. The more power you have, the more favorable your situation. Fiedler identifies power as being either strong or weak.



Leadership Style

Identifying leadership style is the first step in using the model. Fiedler believed that leadership style is fixed, and it can be measured using a scale he developed called Least-Preferred Co-Worker (LPC) Scale

The scale asks you to think about the person who you've least enjoyed working with. This can be a person who you've worked with in your job, or in education or training. You then rate how you feel about this person for each factor, and add up your scores. If your total score is **high**, you're likely to be a **relationship-orientated leader**. If your total score is **low**, you're more likely to be a **task-orientated leader**.

Figure 1: Least-Preferred Co-Worker Scale

Unfriendly	1 2 3 4 5 6 7 8	Friendly
Unpleasant	1 2 3 4 5 6 7 8	Pleasant
Rejecting	1 2 3 4 5 6 7 8	Accepting
Tense	1 2 3 4 5 6 7 8	Relaxed
Cold	1 2 3 4 5 6 7 8	Warm
Boring	1 2 3 4 5 6 7 8	Interesting
Backbiting	1 2 3 4 5 6 7 8	Loyal
Uncooperative	1 2 3 4 5 6 7 8	Cooperative
Hostile	1 2 3 4 5 6 7 8	Supportive
Guarded	1 2 3 4 5 6 7 8	Open
Insincere	1 2 3 4 5 6 7 8	Sincere
Unkind	1 2 3 4 5 6 7 8	Kind
Inconsiderate	1 2 3 4 5 6 7 8	Considerate
Untrustworthy	1 2 3 4 5 6 7 8	Trustworthy
Gloomy	1 2 3 4 5 6 7 8	Cheerful
Quarrelsome	1 2 3 4 5 6 7 8	Harmonious

The model says that task-oriented leaders usually view their LPCs more negatively, resulting in a lower score. Fiedler called these low LPC-leaders. He said that low LPCs are very effective at completing tasks. They're quick to organize a group to get tasks and projects done. Relationship-building is a low priority.

However, relationship-oriented leaders usually view their LPCs more positively, giving them a higher score. These are high-LPC leaders. High LPCs focus more on personal connections, and they're good at avoiding and managing conflict. They're better able to make complex decisions.

NCERC

Controlling

Controlling is one of the managerial functions and it is an important element of the management process. After the planning, organising, staffing and directing have been carried out, the final managerial function of controlling assures that the activities planned are being accomplished or not.

So the function of controlling helps to achieve the desired goals by planning. Management must, therefore, compare actual results with pre-determined standards and take corrective action of necessary.

Control can be defined as the process of analysing whether actions are being taken as planned and taking corrective actions to make these to confirm to planning.

The managerial function of controlling is defined by Koontz and O'Donnell," as the measurement and correction to the performance of activities of subordinates in order to make sure that enterprise objectives and the plans devised to attain them are being accomplished."

Management control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organisation's objectives. Further, it is defined as the process by which managers in the organisation assure that activities and efforts are producing the desired objectives in the organisation. These definitions imply three main points about management control.

First, management control is a process of some inter-related and sequential steps, secondly, management control in the organisation aims at effectiveness and efficiency in the acquisition and utilisation of resources such as money, materials, machinery and manpower. Thirdly, management control in the organisation is designed to further objectives of the organisation.

Nature of Controlling:

1. Control is a Function of Management: Actually control is a follow-up action to the other functions of management performed by managers to control the activities assigned to them in the organisation.

2. Control is Based on Planning: Control is designed to evaluate actual performance against predetermined standards set-up in the organisation. Plans serve as the standards of desired performance. Planning sets the course in the organisation and control ensures action according to the chosen course of action in the organisation.

3. Control is a Dynamic Process: It involves continuous review of standards of performance and results in corrective action, which may lead to changes in other functions of management.

4. Information is the Guide to Control: Control depends upon the information regarding actual performance. Accurate and timely availability of feedback is essential for effective control action. An efficient system of reporting is required for a sound control system. This requires continuing monitoring and review of operations.

5. The Essence of Control is Action: The performance of control is achieved only when corrective action is taken on the basis of feedback information. It is only action, which adjust performance to predetermined standards whenever deviations occur. A good system of control facilities timely action so that there is minimum waste of time and energy.

6. It is a Continuous Activity: Control is not a one-step process but a continuous process. It involves constant revision and analysis of standards resulting from the deviations between actual and planned performance.

7. Delegation is the key to Control: An executive can take corrective action only when he has been delegated necessary authority for it. A person has authority to control these functions for which he is directly accountable. Moreover, control becomes necessary when authority is delegated because the delegator remains responsible for the duty. Control standards help a manager expand his span of management.

8. Control Aims at Future: Control involves the comparison between actual and standards. So corrective action is designed to improve performance in future.

9. Control is a Universal Function of Management: Control is a basic or primary function of management. Every manager has to exercise control over the subordinates' performance, no manager can get things done without the process of controlling. Once a plan becomes operational, follow-up action is required to measure progress, to uncover deficiencies and to take corrective actions.

Therefore, control is an essential managerial function at every level. The process of management is incomplete without controlling.

10. Controlling is Positive: The function of controlling is positive. It is to make things happen i.e. to achieve the goal with instead constraints, or by means of the planned activities. Controlling should never be viewed as being negative in character.

Principles of Controlling:

The followings are the principles of controlling:

- 1. Objectives:**Controls must positively contribute to the achievement of group goals by promptly and accurately detecting deviations from plans with a view to making corrective action possible.
- 2. Interdependence of Plans and Controls:**The principles of interdependence states that more the plans are clear, complete and integrated, and the more that controls are designed to reflect such plans, the more effectively controls will serve the need of managers.
- 3. Control Responsibility:**According to this principle, the primary responsibility for the exercise of controls rests in the manager charged with the performance of the particular plans involved.
- 4. Principal of Controls being in Conformity to Organisation Pattern:**Controls must be designed so as to reflect the character and structure of plans. If the organisation is clear and responsibility for work done is well defined, control becomes more effective and it is simple to isolated persons responsible for deviations.
- 5. Efficiency of Controls:**Control techniques and approaches are effectively detect deviations from plans and make possible corrective actions with the minimum of unsought consequences.
- 6. Future-oriented Controls:**It stresses that controls should be forward looking. Effective controls should be aimed at preventing present and future deviations from plans.
- 7. Individuality of Controls:**Control should be designed to meet the individual requirements of managers in the organisation. Although some control techniques and information can be utilised in the same form by various types of enterprises and managers as a general rule controls should be tailored to meet the specific requirements.
- 8. Strategic Point Control:**Effective and efficient control requires that attention to be given to those factors which are strategic to the appraisal of performance.
- 9. The Exception Principle:**The exception principles whereby exceptions to the standards are notified, should be adopted. Note must be taken of the varying nature of exceptions, as “small” exceptions in certain areas may be of greater significance than ‘larger’ exceptions elsewhere.
- 10. Principal of Review:**The control system should be reviewed periodically. The review exercise may take some or all the points emphasised in the above stated principles. Besides, flexibility and economical nature or controls, should not be lost sight of while reviewing controls.

Aims of Controlling:

The aims of controlling are listed as follows:

1. To find out the progress of the work—the work already completed and the work in progress.
2. To compare the actual performance of the work at different stages with the particulars indicated in the plans and policies.
3. To ascertain the time within which the work is completed.
4. To verify quantity and testing quality of the products.
5. To know the delays or interruptions, if any, in the performance of work and trace the cause of such delay or breakdown.
6. To see that causes of delay are eradicated and operations are suitably re- scheduled.
7. To ensure that variations in the contents and methodology of work are remedied by appropriate adjustments.
8. To assess the cost of materials and labour used and ensure that direct costs and indirect costs do not exceed the budget provisions.
9. To pinpoint the responsibility on individuals at different levels for slackness, indifference, or negligence, if any in the expected levels of performance.
10. To evaluate the value of the work performed and recognize the contributions of the staff towards realisation of the goals of the enterprise.
11. To maintain discipline and morale in the organisation.

Benefits of Controlling:

Following are the advantages of an effective system of control:

1. Control provides the basis for future action in the organisation. Control will reduce the chances of mistakes being repeated in future by suggesting preventive methods.
2. Control facilitates decision making in the organization. The process of control is complete only when corrective measures are taken in the organization. This requires taking a right decision as to what type of follow up action is to be taken while controlling.
3. An effective system of control facilitates decentralization of authority only when corrective measures are taken. This requires taking a right decision as to what type of follow up action is to be taken regarding control.
4. Control and planning go hand in hand in the organisation. Control is the only means to ensure that the plans are being implemented in real sense and not some other else. Control points out the shortcomings of not only planning but also other functions of management such as organising, staffing and directing in the organisation.
5. The existence of a control system has a positive impact on the behavior of the employees in the organisation. They are cautious when performing the duties in the organization and they know that their supervisors in the organisation are observing them.
6. Control helps in coordination of the activities of the various departments in the organisation of the enterprise by providing them unity of direction.

Limitations of Controlling:

A control system may be faced with the following limitations:

1. An organisation cannot control the external factors such as government policy, technological changes, fashion changes etc.
2. Control is an expensive process because sufficient attention has to be paid to observe the performance of the subordinates in the organisation. This requires an expenditure of a lot of time and effort to be made.
3. Control system loses its effectiveness in the organisation when standards of performance cannot be defined in quantitative terms. For example, it is very difficult to measure human behavior and employee morale in the organization.
4. The effectiveness of control mainly depends on the acceptance of subordinates in the organisation. They may resist control because they may feel that it will reduce or curtail their freedom while in duty. It also loses its significance when it is not possible to fix the accountability of the subordinates.

The Organizational Control Process

The control process involves carefully collecting information about a system, process, person, or group of people in order to make necessary decisions about each. Managers set up control systems that consist of four key steps:

1. **Establish standards to measure performance.** Within an organization's overall strategic plan, managers define goals for organizational departments in specific, operational terms that include standards of performance to compare with organizational activities.
2. **Measure actual performance.** Most organizations prepare formal reports of performance measurements that managers review regularly. These measurements should be related to the standards set in the first step of the control process. For example, if sales growth is a target, the organization should have a means of gathering and reporting sales data.
3. **Compare performance with the standards.** This step compares actual activities to performance standards. When managers read computer reports or walk through their plants, they identify whether actual performance meets, exceeds, or falls short of standards. Typically, performance reports simplify such comparison by placing the performance standards for the reporting period alongside the actual performance for the same period and by computing the variance—that is, the difference between each actual amount and the associated standard.
4. **Take corrective actions.** When performance deviates from standards, managers must determine what changes, if any, are necessary and how to apply them. In the productivity and quality-centered environment, workers and managers are often empowered to evaluate their own work. After the evaluator determines the cause or causes of deviation, he or she can take the fourth step—corrective action. The most effective course may be prescribed by policies or may be best left up to employees' judgment and initiative.

These steps must be repeated periodically until the organizational goal is achieved.

Types of Control

It is also valuable to understand that, within the strategic and operational levels of control, there are several types of control. The first two types can be mapped across two dimensions: level of proactivity and outcome versus behavioral. The following table summarizes these along with examples of what such controls might look like.

Feedforward control /Proactivity

Proactivity can be defined as the monitoring of problems in a way that provides their timely prevention, rather than after the fact reaction. In management, this is known as feedforward control; it addresses what can we do ahead of time to help our plan succeed. The essence of feedforward control is to see the problems coming in time to do something about them. For instance, feedforward controls include preventive maintenance on machinery and equipment and due diligence on investments.

Concurrent Controls

The process of monitoring and adjusting ongoing activities and processes is known as concurrent control. Such controls are not necessarily proactive, but they can prevent problems from becoming worse. For this reason, we often describe concurrent control as real-time control because it deals with the present. An example of concurrent control might be adjusting the water temperature of the water while taking a shower.

Feedback Controls

Finally, feedback controls involve gathering information about a completed activity, evaluating that information, and taking steps to improve the similar activities in the future. This is the least proactive of controls and is generally a basis for reactions. Feedback controls permit managers to use information on past performance to bring future performance in line with planned objectives.

Types and Examples of Control

Control	Behavioral control	Outcome control
Feed forward control	Organizational culture	Market demand or economic forecasts
Concurrent control	Hands-on management supervision during a project	The real-time speed of a production line
Feedback control	Qualitative measures of customer satisfaction	Financial measures such as profitability, sales growth

Difference between feedback and feedforward control

S. no	Point of Difference	Feedback control system	Feed Forward Control system
1	Definition	Systems in which corrective action is taken after disturbances affect the output	Systems in which corrective action is taken before disturbances affect the output
2	Necessary requirement	Not required	Measurable Disturbance
3	Corrective action	Corrective action taken after the disturbance occurs on the output.	Corrective action taken before the actual disturbance occurs on the output.
4	Block Diagram		
5	Control Variable adjustment	Variables are adjusted depending on errors.	Variables are adjusted based on prior knowledge and predictions.

Control as a Feedback Loop

In this latter sense, all these types of control function as a feedback mechanism to help leaders and managers make adjustments in the strategy, as perhaps is reflected by changes in the planning, organizing, and leading components.

Why might it be helpful for you to think of controls as part of a feedback loop in the P-O-L-C process? Well, if you are the entrepreneur who is writing the business plan for a completely new business, then you would likely start with the planning component and work your way to controlling—that is, spell out how you are going to tell whether the new venture is on track. However, more often, you will be stepping into an organization that is already operating, and this means that a plan is already in place. With the plan in place, it may be then up to you to figure out the organizing, leading, or control challenges facing the organization.

Essential Requirements of a Good Control System

- 1. Focus on Objectives:**The **control system** should always focus on objectives. It should aim to achieve the objectives of the organisation.
- 2. Suitability:**The control system should be suitable to the needs of the organisation.
- 3. Promptness:**The control system should be prompt. That is, it should find out the deviations quickly. This will help the management to correct the deviations quickly.
- 4. Flexibility:**The control system should be flexible. It should change according to the changes in plans, situations, environments, etc. A rigid control system will always fail. Hence flexibility is necessary for a control system.
- 5. Forward Looking:**The control system should be forward-looking. It should forecast the future deviations. That is, it should find out the deviations before it happens. It should also take steps to prevent these future deviations.
- 6. Economical:**The control system should be economical. This means the cost of the control system should not be more than its benefits.
- 7. Simplicity:**The control system should not be complicated. It should be easy to understand and simple to use.
- 8. Motivating:**The control system should be motivating. That is, it should give more importance to preventing the mistakes and less importance to punishing the employees. So, it should encourage, not discourage the employees.
- 9. Suggestive:**The control system should be suggestive and it should give complete answers for the following questions :-What is the Problem?, Where is the Problem?, How to solve the Problem?
- 10. Proper Standards:**The control system should have proper standards. The standards should be very clear. They should be definite, verifiable, specific and measurable. They should not be too high or too low.

Control Techniques

Managerial control is a systematic effort to set performance standard along with planning targets. There are various techniques of managerial control. All techniques can be classified broadly into two categories. Such as :-

- A. Budgetary control techniques
- B. Non-budgetary control techniques

Budgetary control techniques

A budget is a recorded plan of action expressed in quantitative terms.

Budgetary control is derived from the concept and use of budgets.

According to George R. Terry, "Budgetary" control is a process of comparing the actual results with the corresponding budget data in order to approve accomplishments or to remedy differences by either adjusting the budget estimates or correcting the cause of the difference.

There are generally four steps of modern system of budgetary control. These are mentioned below :-

1) Budget Policy Guidelines :- In an organisation, line managers have to base their expectations on various assumptions in time of preparing budgets. These assumptions are related to economy, political trends, government policies, competitors' actions, strengths of organisation, basic managerial policies etc. The top management should prepare a common set of budget policy guidelines to be followed by all managers of middle and lower level. Budget Policy Guidelines also lay down the fundamental targets necessary for continuous progress of the business.

2) Preparation of Budgets :- According to nature, activities and size of organisation, different types of budget are prepared. Different departmental heads have to prepare their own budget as per guidelines given by the top management. Thereafter the budget committee would discuss all the budgets and observe that budgets are prepared within the safety margin.

Let us discuss some budgets-

i) Sales budget :- Sales budget is a future estimate of expected sales. It is the nerve center or backbone of an organisation. At the time of preparing sales budget different factors are considered such as past sales figures, Assessment and reports of salesmen, availability of raw materials, seasonal fluctuations, availability of finances, and plant capacity etc. Generally sales managers have to prepare the sales budget.

ii) Selling and Distribution Cost budget :- This budget is prepared along with the budget. This budget breaks down the figures for selling costs and distribution costs in groups for controlling such costs. So, this budget is to depend upon the sales budget. Because, selling and distribution cost are changed according to change of sales. The sales managers are responsible for preparing this budget.

iii) Production :- Production budget is also prepared in relation to the sales budget. Production budget is the estimation of production during budget period. Production budget includes amount of production, cost of materials, labour, factory overheads etc. Production planning, plant capacity, stock quantity, sales budget figures etc. are important steps to be followed in time of preparing the production budget.

iv) Production cost budget :- In the production cost budget, the future productions are expressed in terms of money. This budget estimates the total amount of cost to be spent for producing the amount of goods estimated in production budget. Production cost budget has three subsidiary budgets such as

(a) Direct materials, (b) Direct Labour, and (c) Production overheads.

v) Purchase budget :- Purchase budget is derived from the direct materials and indirect material included by the overhead budget. This is a subsidiary budget, which gives the consumption of materials in the production process.

vi) Cash budget :- After preparing all cost budgets, the cash budget is prepared. Cash budget is the anticipated receipt and expenditure for a certain period of time. Different sources of cash as well as various items of expenditure are anticipated in cash budget.

vii) Master budget :- It is a budget for the organisation as a whole. Master budget shows the expected overall effect. It is prepared in the form of projected profit and loss account for the organisation. By the master budget the top management tries to match with the goals set earlier.

3) Reporting of variance :- Cost variance is the difference between a budgeted cost and an actual cost. There are mainly three cost variance. such as material cost variance, labour cost variance and overhead cost variance. On the basis of variance analysis, the managers can take immediate corrective action. The managing director can know the overall position of the organisation from the report of variance. Generally the performance is measured against the budget and the variance is calculated by the budget department under the control of budget officer.

4) Review and Follow-up :- It is an important step in budgetary control process. Generally, the budget committee meets periodically to review the performance of

various departments. If this review and follow-up action is neglected, then no system of budgetary becomes effective.

Objectives of budgetary control:

- i) Ensure planning :- The main objectives of budgetary control is to ensure planning through different budgets.
- ii) Coordinate the activities: - Another objective of budgetary control is to coordinate the different activities of different departments.
- iii) Operation of cost center :- By the budgetary control, various cost centers and departments can operate with efficiency and economy.
- iv) Eliminate wastes :- As a result of budgetary control, an organisation can eliminate its wastes and unnecessary cost, which can ultimately increase profitability.
- v) Capital expenditure : Budgetary control can anticipate capital expenditure of an enterprise for the future.
- vi) Control : Budgetary control can centralise the control system of an organisation.
- vii) Correction : Different corrective measures can be adopted, which can minimise the deviations from the standards established earlier.
- viii) Responsibility : By the budgetary control the responsibility of different employees and officers can be fixed.

In budgetary control, we use following techniques:

1. Variance Analysis

First of all, budgets of different departments are made with estimated figures. After this, it is compared with actual accounting figures. In this technique, we find variances. These variances may be favourable and unfavourable. For example, we have recorded actual quantity and cost of our raw material, after this, it is compared with budgeted value of raw material quantity and cost. Result of this will be material cost variance. Like this, we will find the variance of labour cost and overhead cost. This technique of budgetary control is helpful for reducing the cost of business.

2. Responsibility Accounting

Responsibility accounting is also a good budgetary control technique. In this

technique, we create cost centre, profit centre and investment centre. All these centres are just like department of any organisation. Now, we classify our all employees work on the basis of their centres. Every employee's responsibility is fixed on the basis of his target or performance. After this, we record their performance manually. Then, we fix their accountability. For example, we have fixed the target of sales department is of Rs. 5 Lakh per month. For this, we have appointed expert salesman. But sales department's total per month sales is Rs. 3 Lakh which is Rs. 2 Lakh less than our sales department target. Through this budgetary control, we can take the decision of promotion and demotion of our employees or find other reasons if we do not obtain our targets.

3. Adjustment of Funds

In this technique of budgetary control, top management take the decision to adjust fund from one project to other project. For example, when Govt. of India makes budget for allocation of its total fund in different projects, at that time, it has to take decision for adjustment of funds. For example, railway department needs money for specific new project. If Govt. of India sees that project of IT has excess money, then it can be utilized for railway budget. In adjustment of funds, we also use fund flow analysis. We can also decrease misuse of funds by forecasting proper amount.

4. Zero Base Budgeting (ZBB)

These days zero base budgeting is popular technique of budgetary control. In this technique, every next year budget is made on nil base. It can only be possible, if your estimated income will be equal to the estimated expenses. At that time, difference between estimated income and estimated expenses will be zero. If there is any excess, it will be adjusted. For example, if your estimated revenue is more than estimated expenses, you need to increase the amount or allocate in new estimated expenses. With this, nothing will go to next year. With zero base budgeting technique, you can control on every money which you have to spend. Its base will be the current year income only.

5. Planning-programming Budgetary systems (PPBS)

The PPBS is a formal, systematic structure for making decisions on policy, strategy, and the development of forces and capabilities to accomplish anticipated missions. The PPBS is a cyclic process containing three distinct but interrelated phases

PPBS are about how resources are going to be achieve the various objectives of the organization for example, the care of the elderly, once the objectives have been established programs are identified to meet those objectives and the cost/benefits of alternative programs are assessed.

Planning, programming and budgeting system (PPBS) is a middle type of budget between the traditional character and object budget, on the one hand, and the performance budget on the other. The major contribution of PPBS lies in the planning process, I.E- the process of making program policy decisions that lead to a specific budget and specific multi-year plans.

The preferred programs form in effect a long term plan to be pursued over a number of years; each program budget will disclose the cost of providing a service to satisfy an objective, Broken down into time periods, it therefore informs management in a manner allowing them to make judgments about such effectiveness that would not be possible if programs were fragmented in the department of budget concerned.

A Major shortfall of the PPBS approach to budgeting methods to adequately measure outcomes, this is particularly true in higher education, where a number of factors contribute to the education of a student

PPBS in practice are both “time and labor” intensive but it does link fiscal discussion directly to the planning processes and program implementations processes of the institution. Effective PPBS systems rely on agreed upon goals and objectives for the institution and the unit and achievement of goals is directly related to funding.

Advantages and disadvantages of budgeting

As a matter of fact, budgets offer a number of advantages. They have potential drawbacks as well. Both are summarized below;

Strengths	Weaknesses
Budgets facilitate effective control.	Budgets may be used too rigidly.
Budgets facilitate co-ordination and communication.	Budgets may be time-consuming.
Budgets facilitate record keeping.	Budgets may limit innovation and change.
Budgets are a natural complement to planning.	However; Budgets hampers development, change, flexibility of plan.

Non-budgetary control techniques

There are some other techniques of control, which are not based on budget; These are called non-budgetary control techniques. Some non-budgetary control techniques are discussed below –

i) **Reports:** Different special reports and records can be prepared by the experts for controlling purpose. Such types of special reports contain much deeper information. These are generally called investigative reports. These reports indicate the depth of the problems and can suggest the way of solving the problem.

ii) **Ratio analysis:** - Ratio analysis is the most important method of interpretation the financial statement. A financial ratio implies a relationship between two variable of financial statements of an organisation. Generally the variables for ratio analysis are taken from both profit and loss account and balance sheet. Ratio may be expressed in three ways, such as percentage (25%), a proportion (1:4) and a fraction ($\frac{1}{4}$).

iii) **Break-even analysis:** - Break-even analysis is a graphical technique of control. By this technique business can identify an appropriate number of units to be produced to generate maximum revenue to cover the Cost. By this technique a point is located where the total cost is equal to the total revenue. By the use of this technique production and sales volume can be controlled to avoid loss.

iv) **PERT/CPM:** - These are the network techniques used for controlling the action and performance. The full meaning of PERT is Programme Evaluation and Review Technique and the full meaning of CPM is Critical Path Method. Under the PERT/CPM method a network diagram is prepared to display the sequence of activities necessary for the completion of a project. So, PERT helps an organiser in planning the schedule of a project and to monitor and control the progress of this project. This method also helps in identifying two possible obstacles and shifting the resources as necessary to keep the project on schedule.

v) **Inventory control:** - Inventory control is also called material control, which includes the kind, amount, location and timing of various materials. Material may be classified mainly into three categories ie, Raw-Materials, Work-in-Progress and Finish Goods. In order to make a smooth functioning of the production activities, inventory control is immensely important. The main objective of inventory control is to provide the right material at right time at right place. Different parameters of inventory control are safety inventory level, maximum inventory level, re-ordering level, danger level etc.

vi) **Statistical Quality Control (SQC)** :- SQC is a statistical method which analyse data in the determination and control of quality. This statistical technique of quality control is based on mathematical theory of probability. By this method of production quality can be maintained in an economical manner. This method can immediately rectify the error. It is a preventive method and can save cost and time of inspection work.

vii) **Financial statement:** - Profit and Loss account and balance sheet are the two principle financial statements. These financial statements show the working as well as financial position of a business. There are various techniques of analyzing these financial statements such as ratio analysis, comparative statement, break-even point, trend analysis etc. which can be used as techniques of controlling the day-to-day financial activities of an organisation.

viii) **Human Resource Accounting:** - According to Eric Flamholt Human Resource Accounting is the accounting for people as an organizational resource. It involves measuring the costs incurred by business firms and other organizations to recruit, select, hire, train and develop human assets. It also involves measuring the economic value of people to the organisation. Human Resource Accounting can change the attitude of executives and in this way it can provide necessary data and information for controlling human resource of an organisation.

ix) **Management by Objectives:** - It is also called Result Management. At first Peter Drucker introduced the concept of Management by Objectives in the year 1954. Peter Drucker defines Management by objectives as a system for improving performance in both the individual managers and the enterprise as a whole by setting the objectives at the corporate, department and individual manager's level. Under the process of MBO, periodic review is made and employees are provided with adequate feedback on the actual performance as compared to the planned performance. So, this method can be used as a control technique.

x) **Management Information System :-** Under the Management Information System selected decision oriented information is provided by management for planning, controlling and evaluating the activities of the corporation. It is designed to control the organizational activities at all levels. The Management Information System requires the current as well as future information on marketing, administration, production, research functions etc. On the basis of the data and information supplied by the Management Information System, the top management can formulate appropriate control technique.

CONTENT BEYOND SYLLABUS

BRAINSTORMING

In 1938, Alex F. Osborn, an advertising executive, invented the process of “organized ideation” in a company he headed. The early participants referred to their attempts as “brainstorm sessions,” in the sense that they were using the brain to storm a problem. The term *brainstorming* has now become the accepted way of referring to group attempts to solve specific problems or develop new ideas by amassing spontaneous, unrestrained contributions by members.

Osborn (1979) credited the origin of the process to Hindu teachers in India, who have used the method of *Prai-* (outside yourself) *Barshana* (question) for over 400 years. During such a session, there is no discussion or criticism; evaluation of ideas takes place at later meetings of the same group.

Brainstorming can be used to generate possible solutions for simple problems, but it is unrealistic to expect it to accomplish most problem-solving or planning tasks. The technique is of value as part of a larger effort that includes individual generation of information and ideas and subsequent compilation, evaluation, and selection. Brainstorming can be used to generate *components* of a plan, process, solution, or approach and to produce checklists.

Osborn (1948) saw the value in a session that was designed solely to produce a list of ideas that could be used later in problem solving or other creative processes. The key to the success of the process is that no evaluation or judgment is made of the ideas as they are being generated. Because of this, creativity is not stifled, it is increased. The objective is to generate as many ideas related to the specific topic or question as possible. Studies have shown that the ideas generated by the group tend to get better as the group gets warmed up.

The value of the process is that more good ideas are produced in less time than would be produced in a typical meeting or conference. Discussion, evaluation, and selection occur at a later time.

One of the reasons why brainstorming works is that ideas generate further ideas through the power of association—a process that has been called “hitch-hiking” or “piggybacking.” Also, the technique of “free association” is more powerful when one is working in a group than when one is working alone. Reinforcement is another factor that leads to increased creativity. In the idea-generation phase of brainstorming, all suggestions are rewarded by being received and listed—a positive reinforcement. Nothing is criticized; there is no negative reinforcement.

THE GROUP

The optimum size for a brainstorming group seems to be six to twelve members, and the optimum group consists of women as well as men. Brainstorming is a total-group effort. Breaking into smaller groups would defeat the purpose of the brainstorming session.

BEGINNING

Prior to the actual session, group members should be provided with a one-page memorandum that states the problem to be considered and outlines the brainstorming procedure.

At the beginning of the actual session, if group members are not already acquainted with one another, they should be introduced (a getting-acquainted activity can be used for this). It is a good idea to conduct a warm-up activity, with the group members directed to brainstorm solutions to a simple problem that is unrelated to the topic of the actual session.

THE PROCESS

The leader begins the work session by stating the problem or topic in specific, not general, terms. The problem should be simple rather than complex, so that the group can focus on a single target. The leader should have a list of categories, classifications, or leads (new uses, adaptation, modification, increase, decrease, substitute, rearrange, combine) that can be suggested to the group members if they seem to be getting off track. The leader also can have a few ideas about solutions ready to throw in when the group seems to lag.

It seems to work best if one idea at a time is offered by any one member. This allows all members the space to participate and encourages “piggybacking” on previous ideas.

A recorder (not necessarily the leader) lists all ideas (but *not* who suggested them) on newsprint as soon as they are generated. This list is positioned so that all members can see it. The session also may be tape recorded to make sure that no ideas are lost.

The Rules of Brainstorming

The following criteria are essential to the idea-generation phase of a brainstorming session (Adams, 1979):

1. ***There is no criticism, evaluation, judgment, or defense of ideas*** during the brainstorming session. The purpose of brainstorming is ***to generate as many ideas related to the topic as possible in the time allowed***. Evaluation, judgment, and selection of ideas are the purposes of subsequent sessions.
2. ***Free wheeling and free association is encouraged***. Group members are asked to voice any solutions they can think of, no matter how outrageous or impractical

they seem. There is no limit on “wild” or “far-fetched” ideas. Every idea is to be expressed. It is easier to tone down an idea and to select out later than it is to think up new and creative possibilities.

3. ***Quantity is more desired than quality.*** Group members are encouraged to contribute as many ideas as they think of. The greater the number of ideas generated, the more likely it is that there will be several useful ideas.
4. ***Building on ideas is encouraged.*** Combining, adding to, and “piggybacking” on ideas is part of the creative process. Members can suggest improvements, variations, or combinations of previous ideas.

Stimulating Creativity

Osborn stressed the need for the leader or group to keep the process open. No one should be allowed to comment on the ideas of others unless the comments are totally positive (“that’s great,” “right, right, and.....”). In addition, the sessions should be informal: members should be advised to dress comfortably, and meals, if included, also should be informal. A *playful* atmosphere is most conducive to creativity; often “crackpot” ideas turn out to have a great deal of potential. If it is difficult for the members to loosen up, it may help to create an atmosphere of safety if the norm is established that “no one will comment on who suggested what” outside the brainstorming session.

It is important that the brainstorming session continue after the “first wave” of enthusiastic contributions. Often the most innovative ideas are produced when the group members are forced to push themselves to think of something new.

Subsequent Ideas

It is likely that members will continue to think of ideas for several days after the brainstorming session is held. Some mechanism by which the individual members can get in touch with the leader or recorder after the session will help to ensure that no ideas are lost. In fact, experience indicates that the most valuable ideas are generated after members of the brainstorming group have “slept on” the problem. This process can be facilitated by sending the group members a printed, triple-spaced list of all the ideas that have been generated by the group, with the ideas classified according to categories. A certain amount of time can be allowed for them to fill in additional ideas and return the list.

Only after the group has exhausted its supply of ideas does the brainstorming session move into the idea-evaluation phase. Only now can ideas be criticized as the group strives to reach consensus on a few workable solutions.

EVALUATION AND SELECTION OF IDEAS

There is controversy over whether the group that later evaluates the ideas should be the members of the original brainstorming group. One side argues that it is negative human relations to ask the first group to generate the ideas and then cut them off from the rest of the process. It also may generate negative reactions if they know that others will be critiquing the ideas and deciding which are to be discarded. If the members of the brainstorming group are sufficiently familiar with and interested in the problem to perform their initial task, they are probably qualified to continue the process. This creates a linkage between generation of ideas, evaluation, and development (use of the evaluated ideas) and ensures commitment to the final solution or plan.

On the other hand, some believe that the evaluation should be done by persons who are better aware of feasibilities and who are more objective. It is also recommended that the final evaluation be done by those who are directly responsible for the problem. For several reasons, this may or may not be those who were selected to generate ideas. If the latter course is chosen, however, it is imperative that the members of the brainstorming group be informed of the final disposition of their ideas.

Before it actually begins to consider the list of ideas, the evaluation group (whether it makes final decisions or recommendations only) should establish criteria by which to examine each of the ideas. Such a checklist might include questions about feasibility, complexity, costs, human factors, timing, quality, improvement, resources, safety, work flow, and other pertinent factors.

In many cases, the ideas will pass through several groups before final decisions are made. For example, the critique and evaluation group may be composed of functional managers who make recommendations to higher management. This level of management may consider the recommendations and make decisions or it may select plans to be reviewed and commented on by a cross-section of customers. The ideas may be treated as a springboard for the development of more in-depth plans. Testing may need to be done. In most cases, the nature of the topic or problem will determine how the ideas are handled subsequently.

INDIVIDUAL BRAINSTORMING

Brainstorming can be conducted on an individual basis as well (Hayes, 1981). One can write down possible solutions to a clearly outlined problem, forcing oneself to keep the ideas flowing from the pen without stopping. This use of brainstorming is effective at stopping one of the strongest drains on creativity: self-criticism or negative self-talk. People tend to criticize themselves, their thoughts, and their actions far more than they praise themselves. A person whose every idea is accompanied by the thought, "What a stupid idea; they'll just laugh at me if I tell them," is not very likely to share ideas with others. Because the brainstorming process encourages the continual production of uninhibited ideas, it can be an effective exercise in creativity.

Reviewing one's list when ideas are slow to come may spark new ones. Then, just as in a group session, the individual can consider the list and select those ideas that seem to best solve the problem.

An individual brainstorming session also can be effective when one is trying to write. Just as the idea-generating phase may produce the solution to a problem, it also may help an individual to overcome writer's block and the inhibitions felt when faced with a blank page.

1. No criticism, evaluation, judgment, or defense of ideas during the brainstorming session.
2. No limit on "wild" ideas, no matter how outrageous or impractical they seem. Every idea is to be expressed.
3. Quantity is more desired than quality.
4. "Piggybacking"—building on ideas—is encouraged.

Rules for Brainstorming

THE DECISION CYCLE

The decision-cycle model was developed by Nena and George O'Neill (1974) to illustrate the cyclical nature of decision making and to emphasize the importance of continual reassessment of one's decisions.

The model offers some important concepts concerning the making and implementing of decisions. First, the decision process is represented not as something people do once in a while but as a *continuing process*. Second, it points out that the decision process is an *internal* function. Decision making has no impact on the world outside the individual until he or she makes a commitment and takes some action to change environmental circumstances. Last, when reconsidering a previous decision, an individual can re-evaluate two sources of information: his or her *internal* thoughts and feelings and the *external* environment, as perceived by his or her senses. It is important to recheck these sources regularly.

STAGES OF THE CYCLE

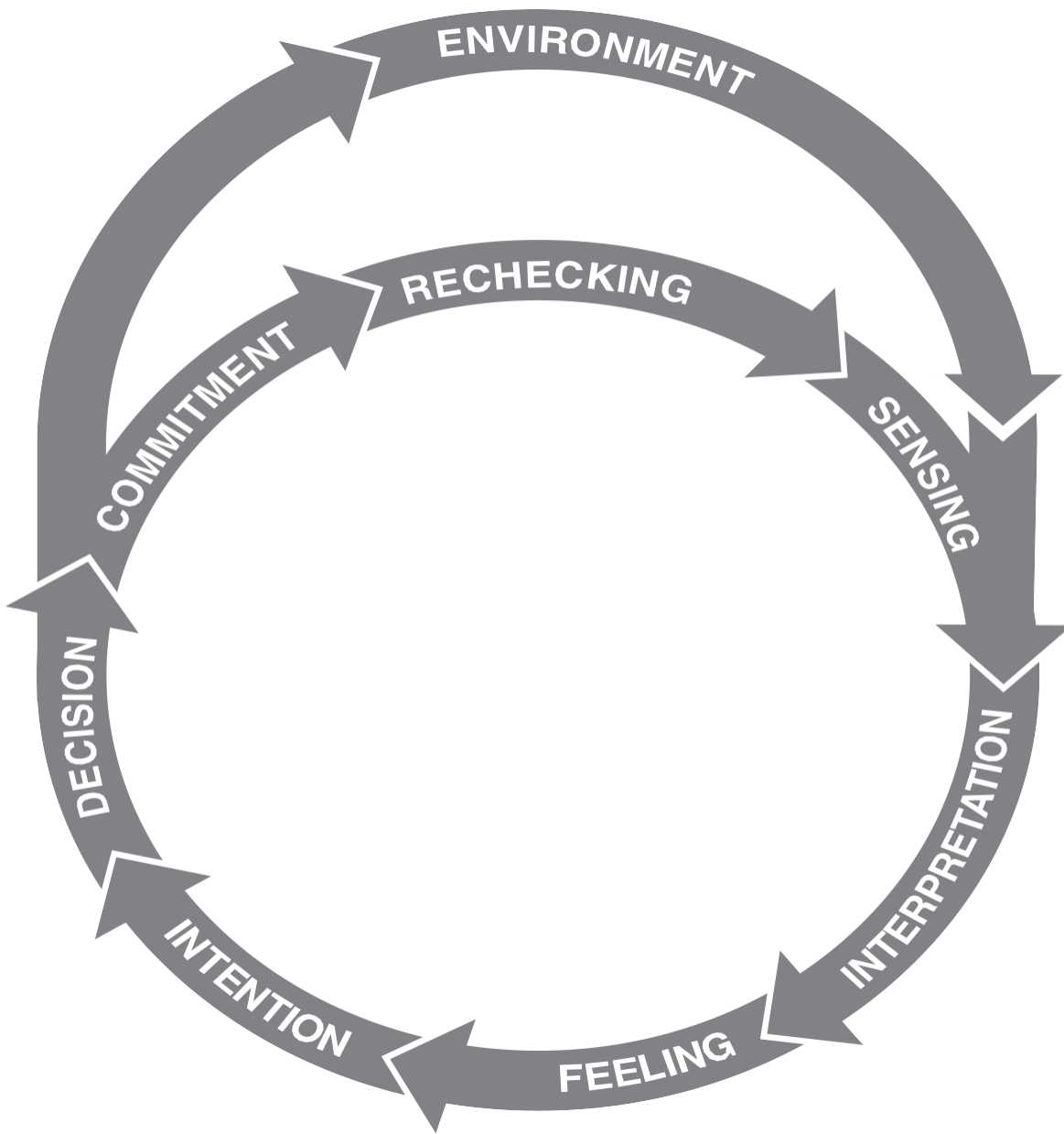
The basic decision cycle has the following stages:

Sensation. An individual's senses continually are being bombarded by external occurrences in his or her environment. Only a small portion of this information about the world actually is received—or selectively responded to—by the receptor cells of the senses and transmitted to the brain. As far as an individual is concerned, this sensory input represents the environment.

Interpretation. An individual's sensory impressions do not mirror the external world. Sensory information is processed (compared with the information already stored in the memory from prior experiences) and interpreted (given meaning). This meaning (impressions, conclusions, assumptions, etc.) is unique to each person because each person's sensory experiences are unique. Sensory experience is influenced by the individual's feelings—past and present—experiences, expectations, values, and other learned preferences. People frequently see what they want to see or hear what they expect to hear.

Feelings. Emotions, both new and remembered, play an important role in modifying what is sensed and thought. The same sensory input can be an entirely different experience when a person is very angry, excited, or depressed than it is when the person is relatively calm. Frequently, the existence and influence of strong feelings are denied or repressed because of social pressure.

Intention. Sensory input, thoughts, and feelings are followed, sometimes simultaneously, by intentions. Although these intentions represent the wishes of the individual, many of them never have any effect on the person's behavior. They simply represent desires, needs, or inferences resulting from the other processes that preceded them.



The Decision Cycle

The individual's sensory experiences, thoughts, feelings, and intentions represent all the information that is available to him or her for making large and small decisions. From this data more intentions are formulated, becoming internal pressures for the individual to modify his or her behavior toward bringing about more desirable circumstances.

Decision. A great number of decisions are made by the individual on an ongoing basis in response to his or her intentions. Most of these decisions are not acted on, and they pass out of consciousness. However, when the person is highly involved in particular decisions, they are converted into behavior.

Commitment. When an individual takes action on a decision, he or she has made a commitment to that decision. The results of this action generally have some impact on the environment, causing a change, however small. This change in the environment stimulates the person's senses, and the cycle continues.

This model implies that the human information system continually is feeding the decision-making process with data from three sources: senses, thoughts, and feelings. These, modified by the individual's values, result in decisions. The commitment step is optional. Before making a commitment, people can recycle for more data as long as they desire.

USE OF THE MODEL

This model distinguishes between making a decision and making a commitment. This distinction suggests a useful strategy: taking action to indicate genuine commitment to a change can facilitate the processing of that change.

The model clearly identifies intention and decision making as internal processes and commitment as an external process. It suggests that an open channel be maintained to both the external and internal data for use in reassessing and revising behavior.

DECISION STYLES AND THE NEED FOR QUALITY AND ACCEPTANCE

Research in the area of problem solving by Norman R.F. Maier (1963) revealed two dimensions that correlate reliably with a decision's effectiveness: *quality* and *acceptance*. In Maier's formula, the effectiveness (E) of a decision is a function of the quality (Q) of the decision times the acceptance (A) of the decision, or $E = f(Q \times A)$.

The *quality* of a decision is objective; it depends on the decision maker's utilization of the known facts (external reality). *Acceptance* of the decision is subjective; it refers to how favorably those who must implement the decision react to it—how they feel about it. A high-quality decision that does not have the full support of the persons who are expected to implement it may lack the necessary support to ensure its success. Thus, decisions may be ineffective because they lack quality, acceptance, or both.

A problem arises in decision making because the methods for dealing with facts are different from those for dealing with feelings. The difference is not always apparent because feelings are often hidden behind rationalizations.

FOUR TYPES OF DESIRED OUTCOMES

Problems differ in the degree to which quality and acceptance are vital to success. Normally, and regardless of the nature of the problem, an individual or group will pay more attention either to quality or acceptance. The required degree of quality and acceptance varies with each decision. Basically, there are four types of desired outcomes.

High quality-High acceptance

High quality-Low acceptance

Low quality-High acceptance

Low quality-Low acceptance

The proportion of these two factors determines the decision style that is most likely to be effective. The following discussions show how they relate.

High Quality-High Acceptance: The Consultative Decision

A high quality-high acceptance decision might involve a manager and a work team in a problem-solving process to reorganize the work distribution and work flow. The quality is in the examination of the existing situation with a logical assessment of areas that could be improved. Although the final decision may be the manager's, all decisions are

based on facts presented by the group. Each participant has a psychological investment in the success of the new procedures, thereby enhancing acceptance. In another case, the manager might make the decision after *consulting* with individuals, but without bringing them together as a group.

High Quality-Low Acceptance: The Command Decision

An example of a high quality-low acceptance—or *command*—decision is the way in which the price is set on a product. In making the decision, management must take into account such facts as production and distribution costs, competition, marketing opportunities, and profit margin. The employees who produce the item are not really concerned with the selling price because they lack the information necessary to analyze it, and the salespeople readily accept the price that is set by the company.

Similarly, solving a mathematical equation is a high-quality, low-acceptance decision—a logical, rational, cognitive process based on fact.

In an organizational setting, when quality is a requirement but acceptance is not, the leader uses the available information and makes the decision without involving the people who will be executing it.

Low Quality-High Acceptance: The Consensus Decision

A low quality-high acceptance decision is made when quality is of minor importance but acceptance among the people affected by the decision is very important. For example, two of three employees of equal ability are required to work on Saturday. The manager may be satisfied with any of them, but it may be an important issue for the employees. In an example cited by Maier, three secretaries in such a situation were asked to decide for themselves which of the two of them would work. All had dates for the Saturday: one with her husband, one with her fiancé, and one with a man she had just met. Because this date was, to the last woman, critical in the development of the relationship, the other two women decided that they would work so that she could have the day off. The acceptance dimension was met.

In another example, the allocation of a new truck to a repair crew presents a problem of perceived fairness if each member feels that he or she is most deserving. When the leader has the crew members participate in making the decision, there tends to be a redistribution of trucks so that all members stand to gain from the introduction of a new truck. Invariably the worst truck is discarded, but the actual allocation varies greatly from one crew to another. Such situations tend to be tailored to fit the values, attitudes, and personalities of the group members.

In these cases, the persons affected by the decision are brought together and the *consensus* decision evolves from shared information, ideas, and feelings. The decision must be acceptable in some degree to all group members.

Low Quality-Low Acceptance: The Convenience Decision

A low quality-low acceptance decision is made in a situation in which the choices are equal, the outcome is not really important to anyone, and so on. The manager may make the decision or the group may flip a coin to decide. The leader generally chooses whatever method is most *convenient* at the time. No special consideration is given to finding the “best” method.

INDIVIDUAL VERSUS GROUP DECISION MAKING

The problem of achieving both quality and acceptance is complex because the *quality* of a decision is related to the logic or rational process used in reaching the decision. If it is made by an individual, the quality of the decision depends on the wisdom of the decision maker (a combination of the person’s knowledge and intelligence). *Acceptance* of a decision is related to the emotional factors that influence the decision-making process, such as the affected persons’ being allowed to participate in the decision. Because wisdom and participation are not conditions for all decision making, it is necessary to use expertise in some situations, participation in others, and a combination of the two in others.

Decisions requiring acceptance—when quality is not seriously endangered—call for joint participation, and the problem must be stated without offending or blaming. “Tell-and-listen” or “consensus” may be the optimal method in such a case. As the need for both quality and acceptance increases, the “problem-solving” approach becomes more and more feasible. Decisions requiring a high degree of both quality and acceptance require problem-solving and consultation skills. The consultative approach is an effective way to achieve quality decisions in group situations and, at the same time, to gain acceptance through participation. Superior-subordinate problem solving applies whenever a manager wishes to influence a subordinate, gain a subordinate’s acceptance of a change, set priorities, or have the subordinate accept unpleasant tasks or conditions.

When the need for quality is high and gaining acceptance is not an objective, decisions can be made successfully by individuals alone. Because such decisions need only to be communicated clearly, the “tell-and-sell” or command method is appropriate.

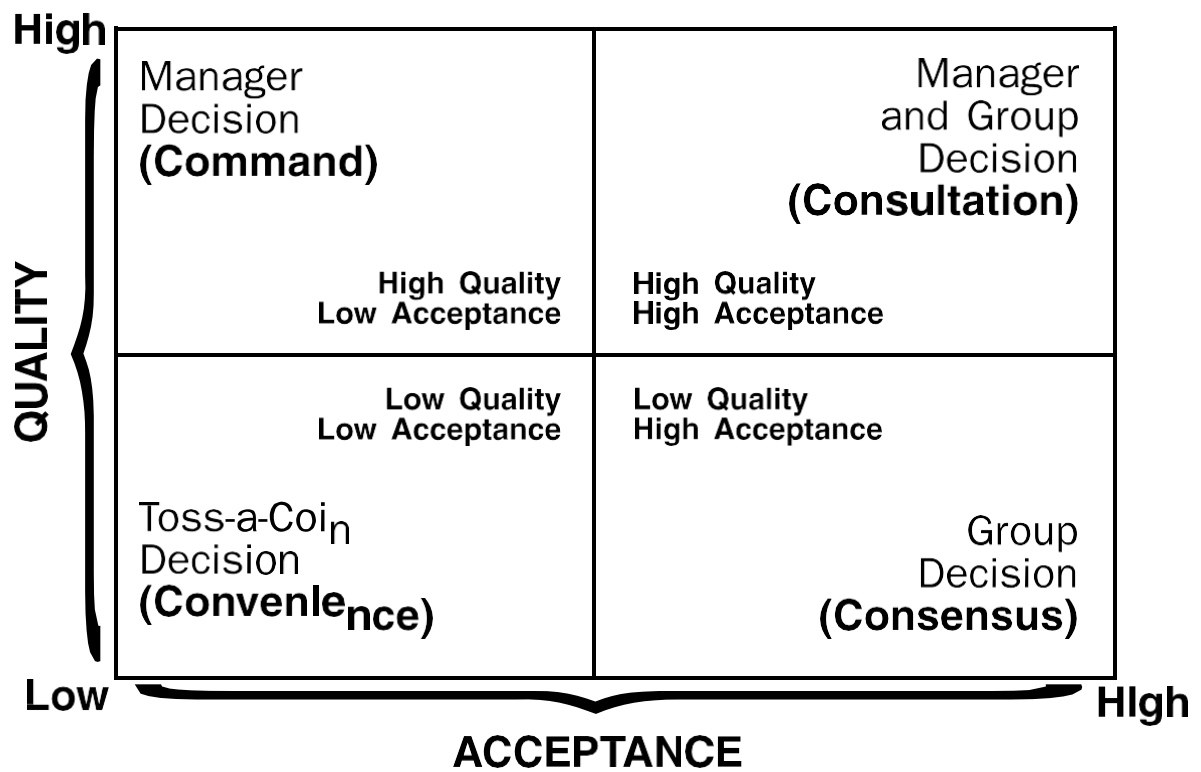
The relationships among quality, acceptance, individual decisions, and group decisions can be illustrated as shown in the figure on the next page.

This does not assume that only the two factors of quality and acceptance are to be considered by a leader in selecting a decision style. Other factors, such as time, capability of subordinates, and the level of trust in the group, must be considered as well. For example, regardless of the quality and acceptance factors, time constraints may require the use of the command model. If the level of trust in the group is low, a consensus decision may be difficult or impossible to achieve. If the trust level in the group is high, a consultative decision style may be very effective for achieving acceptable decisions of high quality.

USE OF THE MODEL

Rick Roskin (1975) suggests that the decision style one chooses should be appropriate to the type of problem being confronted. This discussion is intended to provide leaders with some guidelines that they can use in determining which decision style is likely to be most effective in a particular situation. This model has significant value in leadership, management, and supervisory programs.

The principal drawback to the decision-styles model is its implication that decision-style selection can be reduced to a formula. However, its major advantage is the suggestion that the leader need not always operate from uncertainty. It offers hope that some aspects of leadership can be subjected to scientific discipline, rather than being considered as functions of art or instinct.



Types of Decisions

Chapter 4: Innovation and creativity

“Electricity is not only present in a magnificent thunderstorm and dazzling lightning, but also in a lamp; so also, creativity exists not only where it creates great historical works, but also everywhere human imagination combines, changes, and creates anything new.”

Lev Vygotsky, 1930/1967, cited in Smolucha, 1992, p. 54

Overview

Innovation and creativity are fundamental to all academic disciplines and educational activities, not just the arts. The creative process, as with reflection considered in the previous chapter, is a critical component of making sense of learning experiences. A number of approaches to teaching and learning are considered in this chapter that help to nurture creativity and innovation. See Figure 6 for a visual overview (page 58).

What are innovation and creativity?

Innovation can be broadly thought of as new ideas, new ways of looking at things, new methods or products that have value. Innovation contains the idea of output, of actually producing or doing something differently, making something happen or implementing something new. Innovation almost always involves hard work; persistence and perseverance are necessary as many good ideas never get followed through and developed.

Creativity is an active process necessarily involved in innovation. It is a learning habit that requires skill as well as specific understanding of the contexts in which creativity is being applied. The creative process is at the heart of innovation and often the words are used interchangeably.

According to Kampylis and Berki (2014, p. 6):

'Creative thinking is defined as the thinking that enables students to apply their imagination to generating ideas, questions and hypotheses, experimenting with alternatives and to evaluating their own and their peers' ideas, final products and processes.'

Kaufman and Beghetto (2009, p. 6) developed four categories of creativity which help to reveal the nuances between different levels and types of creativity. See Table 11 (page 54).

Table 11: Four categories of creativity

<p>Big-C creativity (sometimes called 'high' creativity)</p>	<p>Big-C creativity is reserved to describe the work of an elite few who have transformed their discipline with their inventions. Their work has been generally accepted as being innovative and ground-breaking, even if it was considered controversial when it was first created. Some examples are scientific works such as Einstein's theory of relativity and Darwin's theory of evolution, and works of art such as Picasso's Guernica, Jane Austen's novel Emma or Ludwig van Beethoven's Symphony No. 9 in D Minor. Big-C creativity is out of reach of most of us, and big-C creators themselves are often as extraordinary as their creations.</p>
<p>Pro-c creativity</p>	<p>This type of creativity has involved time (usually at least 10 years) and effort to develop. A musician who showed promise as a child, has trained to degree level and now makes a living teaching and playing classical music could be classified as pro-c. A physicist working at a university who teaches and undertakes academic research could also be classified as pro-c.</p>
<p>Little-c creativity</p>	<p>Little-c creativity is about 'acting with flexibility, intelligence and novelty in the everyday' (Craft, 2005, p. 43). This results in creating something new that has 'originality and meaningfulness' (Richards, 2007, p. 5). This everyday kind of creativity can be found in the kind of person who can resolve a complex problem at work, is a keen gardener with an eye for design, or takes creative photographs and exhibits them on a photo-sharing website. School-age learners may work at little-c level if they engage in purposeful practice in their discipline. Little-c creativity involves practice and may be developed over a long period of time. The internet has provided the infrastructure for little-c creativity to thrive. Websites such as YouTube, Instagram and Etsy enable creative people to share their expertise and work.</p>
<p>Mini-c creativity</p>	<p>Mini-c is defined as the 'novel and personally meaningful interpretation of experiences, actions, and events' (Beghetto & Kaufman, 2007, p. 73). This is the kind of creativity that can be nurtured by teachers and parents. 'Mini-c happens when a person demonstrates "flexibility, intelligence and novelty" in their thinking' (Craft, 2005, p. 19). It is usually applied, but not necessarily limited, to children's creativity.</p> <p>Mini-c creativity may not be visible to outsiders and may consist purely of ideas and connections that the learner creates. As Vygotsky (1967, p. 7) explains: 'Any human act that gives rise to something new is referred to as a creative act, regardless of whether what is constructed is a physical object or some mental or emotional construct that lives within the person who created it and is known only to him.' Piaget suggested that 'to understand is to invent' (1976, cited by Richards, 2007, p. 95) meaning that a learner 'invents' an understanding of new material for themselves. Mini-c creativity could describe a learner's achievement in finding several different ways of approaching a maths problem. It could also involve making a new connection between their existing knowledge and a new piece of information which helps them to understand the subject more fully.</p>

The boundaries between these categories can be blurred and they are not age specific. A person could fit into multiple categories in different areas of their life. For example, a chef who could produce dishes at a pro-C level while at work might work at a little-c level when attending a watercolour painting class.

The two categories most relevant to schools are little-c and mini-c creativity. They highlight the fact that being creative and innovative is not so much about revolutionary ideas or new inventions that change the world. It is about individual growth achieved through small insights. Creativity and innovation are fundamental to all disciplines and an essential part of the learning process, forming an important dimension of learning how to learn, which we considered in Chapter 3. They are also fundamental to teachers improving their professional practice and to school development.

Being innovative and creative is dependent on the other attributes. Being creative requires reflection, encourages engagement and develops confidence and responsibility. The ability and inclination to be creative is essential to living a fulfilled and successful life, and it is valued in higher education and the workplace. There are many other benefits of maximising one's own creative potential such as physical and psychological health improvements, improved resilience in the face of difficulties and even lower levels of aggression (Richards, 2007, p.9).

Craft (2005, p.15) points out that our understanding of innovation and creativity have progressed and broadened over time. In the early 20th century creativity was considered to be an innate, elusive quality that individuals were born with. Initially creativity was most closely associated with the arts but grew to include science, technology and other disciplines. In the 21st century creativity is increasingly viewed as a distributed and collaborative process of communal sense making and problem solving.

As with all the learner attributes, cultural perspectives are also very important when considering creativity. Confucian heritage cultures, for example, tend to see creativity more as a collective exercise. They place responsibility for creativity on the social group rather than the individual. Individuals, therefore, are not encouraged to stand out from the class in the same way or to the same extent as in Western cultures. This does not mean that creativity is in any way less valued. As with all the learner attributes, ideas presented in this chapter need to be interpreted and implemented in a culturally sensitive way.

Creativity, innovation and learning

As discussed in Chapter 1, learning involves challenging, refining and improving understanding by being made to think hard. Sometimes, to understand new concepts and broaden perspectives, our approaches to thinking need to be creative, imaginative and lateral (incorporating new ways of looking at things), as well as linear (using existing patterns of thought).

One characteristic of the creative process that makes it particularly powerful is that it requires not only knowledge and understanding of the domain being investigated, but also a willingness to question and not be constrained by existing knowledge. Learners should understand how they can question or challenge established knowledge to help them to formulate their own understanding, and imagination can play an important role:

'One cannot think creatively unless one has the knowledge with which to think creatively. Creativity represents a balance between knowledge and freeing oneself of that knowledge' (Johnson-Laird, 1988, p.207, cited by Sternberg, 2012, p.4).

For creative thinking to deepen and extend learning, rather than be an enjoyable but superficial activity, it must be grounded in understanding of the content being investigated. It is vital that learners have sufficient understanding of the material with which they are being asked to be creative. Creative practice needs to complement diligent and deliberate practice that develops foundational skills – not be a substitute for it.

A revised version of Bloom's original 1956 taxonomy by Krathwohl (2002, p.212–218; see Figure 4) includes creativity in the taxonomy and places creativity above evaluation as a higher order thinking skill. An alternative, and probably more accurate, representation would be to include creativity as a process involved in skills at all levels represented in the taxonomy, and increasingly so with higher order skills. It might be thought that remembering factual information does not involve creative processes. In fact, as the section later in this chapter on mind maps reveals, creative approaches can be very helpful in remembering information. The processes used by champions at the World Memory Championships are highly creative as they use the mind's capacity to recognise and remember chunks or patterns that have meaning to the individual much more effectively than isolated facts.

Creative learning activities, like any other, need to respect Vygotsky's zone of proximal development with appropriate scaffolding provided by the teacher.

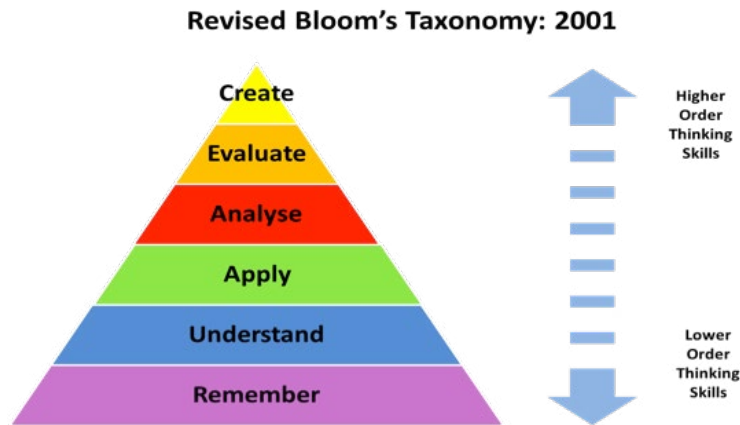


Figure 4: A revised version of Bloom's taxonomy

This is an area in which cultural sensitivity may be particularly important. If students are not used to being asked to demonstrate creative habits and skills they need to be guided. How the creative activity links to broader learning objectives needs to be clearly understood by teachers and students.

Having a creative habit, the disposition to behave creatively is critical. Csikszentmihalyi (2002, p.99) emphasises the importance of having a playful attitude while remaining disciplined. Whenever possible, play should be used to extend the range of opportunities to think. There are several character traits and learning habits that affect a learner's personal disposition, motivation and confidence to be creative. For example:

- resilience: an ability to tolerate uncertainty and persevere at a task to overcome obstacles
- not being afraid to make and learn from mistakes
- an ability to suspend judgement while generating ideas

- willingness to take sensible risks or go out of their comfort zone in their work.

A creative learner needs to be able to develop and apply a set of skills that they can use in the creative process. These include being able to:

- clarify, analyse and re-define the problem or question to uncover new ways of looking at it
- ask thoughtful questions
- notice connections between seemingly unrelated subject matter
- challenge established wisdom by asking: how would I improve this?
- recognise alternative possibilities
- look at things from different perspectives.

Creative processes usually require self-regulation, and the ideas relating to reflection and metacognition considered in Chapter 3 apply. These include learners:

- being aware of their own skills, both strengths and limitations
- thinking of a range of different strategies or approaches to use in response to a problem or question
- planning which approach to use
- monitoring their work, and being flexible enough to change to a different approach if necessary
- critically evaluating their work at appropriate points

Creating a culture of creativity in schools and classrooms

We are all born with a creative instinct and all people have creative potential. Young children naturally engage in play – a state when the imagination is used to 'try out' situations and possibilities. A cardboard box becomes a car, grass becomes food, a toy comes alive. As children mature and move through their school career, creativity can be stifled as an unintended consequence of other pressures. Students can become fearful of making mistakes if they only receive recognition for giving an answer

Chapter 4 continued

the teacher is looking for rather than valid original thinking and ideas. A study on creativity and innovation in education in European member states (Craft, 2005, p.21) found that teachers preferred their learners to be 'conforming' or 'considerate' to 'risk taking' and 'playful' (Ferrari, Cachia & Punie, 2009, p.21). A culture of 'one right answer' stops learners from being willing to make mistakes. They quickly learn to guess what answer the teacher has in their heads. As von Oech (1998, p.14) points out, 'many of us have been taught that the best ideas are in someone else's head'.

Like any habit, creativity can be encouraged or discouraged. Having a learning rather than a performance orientation, considered in Chapter 3, helps to create an environment where creativity is encouraged. Schools that are successful at stimulating creative learning:

- value and celebrate learners' creative and innovative contributions
- do not overcrowd the curriculum. They focus on depth as well as breadth. They manage time effectively, providing opportunities for pupils to explore, concentrate for extended periods of time, reflect, discuss and review. Students are expected to reflect deeply on the material that they are learning and to make connections between subjects and topics
- encourage a broad and balanced curriculum so that students experience a range of subjects and activities, including the arts
- encourage students not studying the arts as qualifications to pursue creative activities in the co-curricular programme
- develop codes of behaviour and classroom procedures that value and promote creativity
- encourage sensible risk taking, for example, teachers trying something new in their lessons.

The creative process requires time and collaboration, so creating time for creative thinking activities is important. Using a flipped classroom approach for example, where learners prepare content and do written exercises preparing for lessons in advance at home, allows teachers to plan for higher-level creative thinking activities during class time. Another approach that helps students to make connections across topic areas and

Figure 5: A creativity orientation



understand the discipline as a whole is spaced delivery of content in lessons. This involves teachers revisiting related subject matter over a long time rather than just teaching each topic as a separate entity.

Creating a climate in the school by providing an environment that supports innovation can be very powerful, as Case study 10 shows:

Chapter 4 continued

Figure 6: Visual overview of innovation and creativity (Hover your mouse over the image to enlarge)

Case study 10:

St. Andrew's Scots School, Buenos Aires, Argentina – The Learnerspace: a new pedagogy by design



Watch the video at
<https://vimeo.com/228213052>

Makerspaces have become ubiquitous in schools all over the world to encourage students to apply creativity and critical thinking through design. A similar approach to learning, transforming a traditional environment into a Learnerspace can also be a great catalyst for moving pedagogy towards a learner-centred model.

Of all the many spaces in school, the school library lends itself to becoming an emblem for a new learning paradigm. In that context, we set out to embody the principles of 21st century learning through a transformation that was as profound as it was bold, and that went far beyond architectural modifications.

The first dimension of change entailed making true on the principle that learning is continuous, and transcends the physical and chronological boundaries of the classroom. By de-centralising books from the library and sending them out to school corridors and departments, we sent out the message that learning is not restricted in space and time. By allowing students to freely check out books without restrictions or controls, throughout the school, we explicitly stated that learning is a transcendent value that knows no limits or constraints.

In moving from a library to Learnerspace, the most important element of change was making sure that the redesign of the space was conducive to joyful learning. Three distinct spaces were created: a large, flexible workspace with furniture that could be rearranged freely to suit multiple configurations; a cave-like, forest-themed silent room; and a collaborative room with two projectors and floor-to-ceiling walls that students can write on. All throughout the Learnerspace, blackened walls invited students to express themselves using chalk.

Student reactions surpassed our best expectations. From being a space that students mostly used to seek refuge from cold weather, the library almost immediately became the centre of gravity of the school. Students naturally tended to occupy and make spaces come alive in ways that were hitherto unforeseen. Teachers started delivering their lessons at the Learnerspace, often sharing space with colleagues, and increasingly applying differentiation of teaching to the needs of individual learners.

And then the true joy of the learning process gradually emerged. Midday philosophy talks, quiz show-type contests, educational board games, and even a chessboard with a clock for blitz games also became manifestations that learning could be an enjoyable process.

The Learnerspace embodies most of the desired learner attributes: students discuss their learning and naturally engage in metacognitive reflections, propitiated by the collaborative environment and the literal writing on the walls; they become less teacher dependent; exercise their creativity by expressing themselves actively within the space; work on the development of creative projects; take possession of the space in meetings related to their leadership roles; and create new extracurricular projects.

Many of the community forums and discussions also take place in the agora-like open space, with an openness that inspires the discussions and projects that emerge from such gatherings. The importance of the physical learning environment is often underestimated in how it can truly foster a new learning modality consistent with the modern information-rich world. Sometimes schools are daunted by the magnitude of the change required, but our Learnerspace has joyfully demonstrated that a few changes in the layout can have a substantial and inspiring effect.

Common misconceptions about creativity

Runco (1999, cited in Ferrari, Cachia & Punie, 2009, p.16) explains that people sometimes hold tacit beliefs or theories about the nature of creativity which can have detrimental effects on attempts to nurture creativity in an educational context. These theories are different from what research suggests is in fact the case. For example, many people believe that creativity is a natural talent which cannot be taught, whereas studies have shown that learners can improve their creative thinking skills with the right type of input.

Figure 7: Common misconceptions about creativity



Elaboration of Sharp (2004), Beghetto (2007b), Runco (1999) as cited in Ferrari et al. (2009) p17

Creative teachers: How can teachers help learners to develop their creative habits and skills?

'Cambridge teachers are creative, experimenting with new ideas and pursuing an enquiring approach in their teaching. They are open to new challenges, being resourceful, imaginative, and flexible. They are always ready to learn and apply new skills and techniques.'

Chapter 4 of the *Developing your School with Cambridge guide* considers the attributes of effective teachers (available at www.cambridgeinternational.org/teaching-and-learning/). It highlights that effective teachers have a deep knowledge of their subject as well as an understanding of how students think about subject content at different developmental stages (pedagogical knowledge). They are able to make thinking visible, helping learners to recognise misconceptions and manage their own learning. Because the creative process is fundamental to student learning, nurturing creativity is also an aspect of good teaching in all subjects.

Fostering a creative climate in the school, supportive of creative teacher professionalism, is another theme considered in the *Developing your School with Cambridge guide*. It is very hard for a teacher to be creative if they are following a prescribed curriculum and given little or no room for their own creative input into their teaching practice. Syllabuses, textbooks and teacher support material are extremely important in helping to structure and support learning but they also need to allow for the teacher's professional creativity. Teachers can support creativity and innovation by:

1. Role modelling creative habits

Nothing is more important than the teacher exemplifying the habits, behaviours and thinking they want students to demonstrate. They need to exemplify creative traits such as curiosity and the development of creative skills (see thinking routines later in this chapter).

2. Appreciating the critical importance of questions, both their own and those asked by students

Considered later in this chapter.

3. Treating mistakes as learning opportunities and encouraging learners to take sensible risks in the classroom

Encouraging learners to take 'sensible risks' in their work is important for building up their creative confidence. It is important that this takes place in a supportive environment, and that the teacher and learner have discussed what boundaries are acceptable in their context. It is also important to set some ground rules in collaboration with learners.

4. Giving learners sufficient time to complete their work

Sometimes ideas need time to develop before becoming valuable. Giving learners the scope to come up with their own ideas can be challenging for both teachers and learners. Learners will need time to think and work independently of the teacher. Delay judgement of learners' ideas until they have had time to work them out properly.

5. Scaffolding tasks carefully to provide the appropriate level of challenge

Ideally, a teacher should try to design tasks that help the learner to cross over into this area by 'scaffolding', or supporting them at first, and then withdrawing support so that the learner can increasingly achieve the task on their own.

Even a small change in teaching approach can bring about a change in a learner's creative disposition. If learners start to see that there is not always 'one right answer' to many questions, both in school and in life, then their creative confidence will grow. The most important thing of all is for learners to lay the foundation of their personal creative abilities, on which they will build throughout their lives

Incorporating creativity into classroom practice across the curriculum

Problem solving and enquiry are at the heart of learning. By definition, they require learners to think hard using their existing understanding to engage with the question or problem at hand and work out solutions.

Pitching questions or problems at exactly the right level to stretch student thinking, and providing just enough support, is the mark of a good teacher. How teachers present problems and questions will vary depending on student age, the local culture, the discipline being studied and many other factors. There is a place for a wide range of approaches including whole-class instruction as well as individual and group collaborative work, and some variety is important.

Sometimes it is incorrectly assumed that creativity occurs best in group work with the teacher acting as a facilitator. In fact, direct instruction involving the whole class can encourage creativity as long as the classroom culture is supportive and the class focuses on powerful questions and problems. It is important to note that direct instruction, well

done, is identified in John Hattie's work (2009, p. 204) as a highly effective approach to teaching and learning. Direct instruction should involve a highly skilled active process in which the teacher engages and challenges student thinking, responding quickly to student thinking as it emerges. Discussions are focused on important concepts and ideas with questions from students. The teacher stimulates thought and encourages new ideas and new ways of thinking. Both students and teachers see errors as guiding what still needs to be learned rather than signalling failure.

Enquiry-based learning is often associated with student-led projects. In this context learning involves a teacher and/or learners setting a meaningful problem or question which challenges and extends learners' understanding over an extended period of time. Projects could be within one subject or combine two or more subjects. The problems or questions may be open ended, complex and multi-faceted. Projects often culminate in learners doing a presentation of their work to the rest of the class, but the 'product' created could be something that is made public such as a blog, website, exhibition or magazine. By its nature, project-based learning involves learners using reflective, creative and critical thinking skills in collaboration with others.

For project-based learning to work well it is important that the learning objectives are clear, supportive of the broader curriculum, and the teacher plays an active role in supporting the development of student understanding. This may involve the teacher standing back for long periods, allowing students to explore and experiment and think through the problem, but they need to be active in challenging student thinking and bringing learning to a productive conclusion. Cambridge Global Perspectives (considered in Chapter 7) provides well-structured examples of this approach.

One advantage of enquiry-based learning is that it provides an opportunity for learners to collaboratively explore a question or problem from multiple perspectives using lateral as well as linear thinking. Edward De Bono is credited with inventing the concept of lateral thinking and has developed a number of approaches including the Six Thinking Hats (1993, p. 54), a strategy that can be used to help learners at all levels and in any subject, to think about a question from multiple perspectives (see De Bono in the Resources section).

Using questions to trigger creative thinking

Socrates (470–399 BC), popularised through Plato's writings, believed the best form of teaching was through using skilled, disciplined questioning to deeply explore ideas resulting in improved understanding. This technique has become known as 'Socratic questioning' and is a fundamentally important teaching and learning approach in all disciplines. A good question, from the teacher or student, has the power of making student thinking visible and is a natural part of the ongoing feedback loop in classrooms between students and teachers, helping to guide the instructional process.

On average, teachers ask between 300 and 400 questions a day (Leven & Long, 1981, p.29). If a teacher carefully plans the type, wording and delivery of questions that they are going to ask in a lesson, research shows that the quality of learners' thinking and responses will improve (Budd Rowe, 1986, pp.43–50). Questions that stimulate responses that require complex mental processing can encourage creativity. What if...? and Why...? questions tend to stimulate creative and critical thinking, especially if followed by more questions that probe and encourage the learner to go further (Kazemi, 1998, pp.410–414).

Asking learners to think of their own questions is a particularly valuable activity. Guy Claxton (cited in Scales, 2013, p.250) points out: 'Asking good questions is the basis for becoming a successful learner. If children aren't asking questions, they're being spoon-fed.' A learner formulating a question can illuminate their current thinking, helping to guide instruction, as well as being a creative activity in its own right. Encouraging learners to ask questions can:

- develop their curiosity about the subject, helping with engagement
- stimulate learners to 'think hard' about a topic
- consolidate a learner's understanding of the material
- enable learners to look at a topic from different perspectives
- clarify a goal or plan for their own investigations
- inspire them to want to find out the answer.

One line of questioning that can encourage creative input is 'possibility thinking'. This requires learners to explore ideas and use their imagination to generate lots of possibilities. If a teacher regularly asks questions that have more than one answer during lessons, this can develop an atmosphere where learners feel that their unique contributions are welcomed and valued. This helps learners to develop their creative disposition as described earlier in this chapter.

Table 12: Examples of possibility thinking

Consider asking your learners questions that have more than one possible answer

In maths: 'How many ways can you find to make 24 using any mathematical operation?'

What was the question?

'The answer is... 1989, ... what was the question?'

Give learners a word or number that could be the answer to many different questions in your subject. For example, the question could be:

- When did the Berlin Wall fall?
- In which year did South Africa start to dismantle the apartheid system?
- In which year did the Cold War end?
- Which year saw the dissolution of the Soviet Union?
- Which year saw the end of the Soviet Union's occupation of Afghanistan?
- When did Tim Berners-Lee produce the proposal that led to the World Wide Web?

Thinking routines, introduced in Chapter 3 (see Harvard University's Project Zero 'Visible Learning' resources at the end of the chapter) can be helpful in generating questions and nurturing critical and creative thinking skills, emphasising the use of discussion and collaboration in the classroom. One example of a thinking routine is below in Table 13. This can be adapted to almost any subject or context to prompt thinking and questions from learners.

Table 13: Harvard Project Zero – Artful thinking routine: See/Wonder/Connect

This thinking routine is useful to trigger questions and thinking about a topic for which you have a related photograph, artwork or object. For example, photographs of a specific place for a geography case study.

See: Show learners an artwork, photograph or object that relates to your subject. This could be in an art gallery, or the classroom.

Wonder: Brainstorm a list of 3–5 questions about the artwork. Use these question stems as starters:

I wonder... Why... What are the reasons... What if... I am puzzled by... How would it be different if... What if we knew...? If I could interview the artist/maker, I'd ask...

Connect: Compare the artwork/object/photograph to others you've seen. How are they similar? How are they different?

The questions that learners formulate should be recorded and displayed if possible, to show the value that the teacher places on them

Mathematics, creativity and innovation

'Creativity is what maths is all about... We're coming up with some completely unexpected patterns, either in the reasoning or the results... We're thinking in terms of beauty and creativity, but the outside world thinks of us like a computer' (Sir Andrew Wiles, who proved Fermat's Last Theorem).

The Fields Medal is the mathematical equivalent of the Nobel Prize, awarded to mathematicians who have made major contributions to the field. In 2014, it was awarded to a successful young mathematician called Manjul Bhargava. His achievement was to simplify a very complicated mathematical 'proof' from the 18th century into a few lines. He was inspired by seeing a Rubik's Cube in his room, and imagined that the numbers that he was working on were applied to the corners of the Rubik's Cube. 'If you think about things the way someone else does, then you will never understand it as well as if you think about it your own way,' he said about the creative process that led to his breakthrough.

That mathematics is still being created often comes as a surprise to most students, and many teachers. Their perception is that mathematics is the one subject in which you know conclusively that you have the right answer. Indeed, many students prefer mathematics over other subjects precisely because of this. The misconception arises because they believe that calculation, and solving routine problems such as those assessed in qualifications, is mathematics. In fact the whole point of learning mathematics is to solve problems, including those which are non-routine, and that of course involves thinking creatively.

While Fields medallists – who are certainly exhibiting Big-C creativity – come along only once in a while, there are plenty of opportunities in mathematics lessons to support students in becoming creative mathematicians of the small-c or mini-c variety. Indeed, a mathematics scheme of work that does not include opportunities for students to think mathematically – to explore, discover, imagine and produce some mathematics which is original to them – needs serious adjustment.

So what does creativity look like in the mathematics classroom?

Firstly, creativity is considerably inhibited if students do not have an adequate mathematical toolbox. In other words, they need to have a reasonably secure base of

knowledge and skills to draw on. However, creative activities should not be restricted to those who are already good mathematicians. The very act of being creative can itself enhance students' understanding and fluency, so such tasks are suitable for all.

To support students in being creative, teachers offer tasks and activities which allow students to:

1. Find multiple ways of solving a problem.
2. Ask their own questions as well as answering the teacher's.
3. Discover relationships, patterns and make connections that are new to them.
4. Conjecture about the results of making changes.

The NRICH project (www.nrich.maths.org) offers 'low threshold, high ceiling' tasks. These are open-ended tasks which everyone can begin, but which have enough challenge built into them to occupy the most confident and competent, so they are suitable for whole-class teaching.

Next are four examples of such tasks.

1. Finding multiple ways of solving a problem

This activity, recorded on squared paper (with square size appropriate to age of student) supports the concept of equivalent areas. The examples offered show identical halves and the majority of students will be able to replicate this idea. However, creative individuals will look for examples where although the areas are equivalent, the shapes of the halves are not the same. This is an example of students devising their own solutions and simultaneously extending their idea of a half, and of area. To see how students solved this, visit nrich.maths.org/1788/solution

Halving

Stage: 1 ★★

These images show squares split in half:

How might you check that each was correct?
Can you think of more ways to split a square into two halves?

2. Ask their own questions

The mathematics in Got It! is quite trivial – adding small numbers. However, to 'solve' the question, students have to work out how to win. This requires asking the right questions and trying out lots of strategies. The question includes some 'high ceiling' hints such as changing the target – but students have to choose wisely if they are to succeed. For an interactive version visit nrich.maths.org/1272

Got It!



This is a game for two players.

Start with the target number of **23**.

The first player chooses a whole number from 1 to 4.

Players take turns to add a whole number from 1 to 4 to the running total.

The player who hits the target of 23 wins the game.

Can you find a winning strategy?
Can you always win?

What happens if you choose a new target number?
What happens if you change the range of numbers you can add?
Can you work out a winning strategy for any target and any range of numbers?

nrich.maths.org

3. Discover relationships

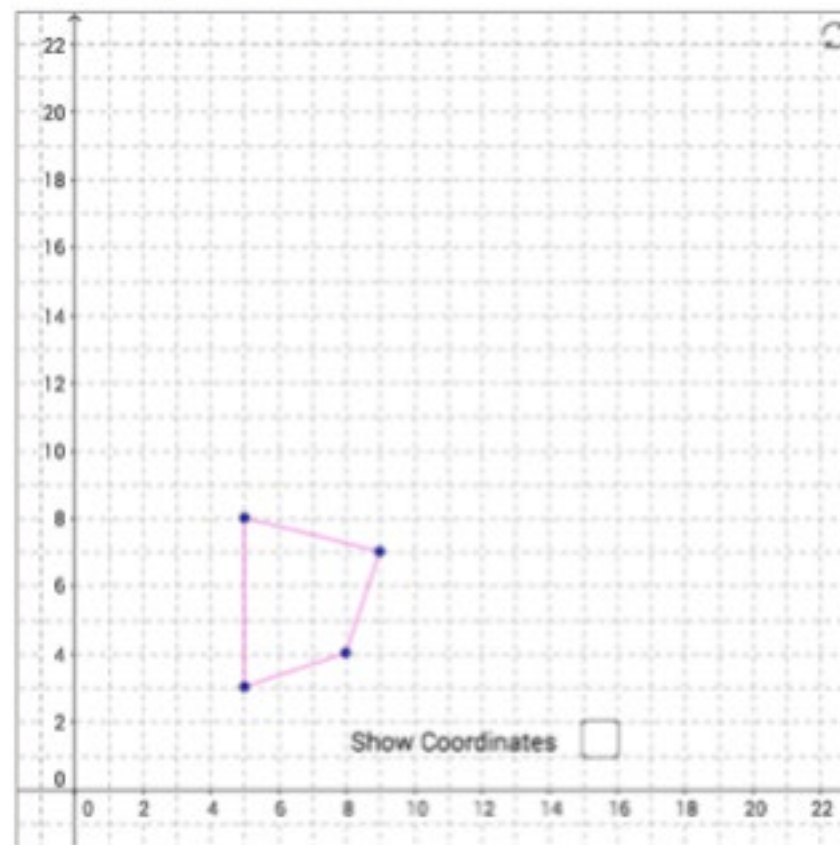
This interactive task allows students to play around with the characteristics of squares, using visual clues initially. To solve the last question, they have to focus on the coordinates and are then confronted with the idea that points in certain relationships have coordinates that fit a pattern. This activity highlights the power of digital technology to provide instant feedback – a hugely important part of working creatively. Visit nrich.maths.org/10733 to find out more.

Coordinates of Corners

Stage: 3 and 4

This resource is part of ["Dotty Grids - Exploring Coordinates and Vectors"](#)

Move the dots below to make some squares. Can you make a variety of squares whose sides are not parallel to the axes?



If you have a set of four coordinates, is there a quick way to decide (without drawing) whether they form a square?

4. Conjecture about making changes

White Box (nrich.maths.org/7007) models the scientific process of working out the structure of atoms and molecules. It is an ideal activity to support students in making conjectures or hypotheses, as they work systematically to change the layout, record their findings and deduce what is happening. Where must the triangle be to produce that result? What if I move it to...? As with 3 above, these modelling-type questions would not be possible without immediate feedback.

A proficient mathematician therefore needs not only a thorough knowledge and understanding of the subject matter, but they also need creative thinking skills to be able to manipulate that knowledge and to become truly innovative.

White Box

Stage: 2, 3, 4 and 5 ★

The White Box contains a number of filled triangles.

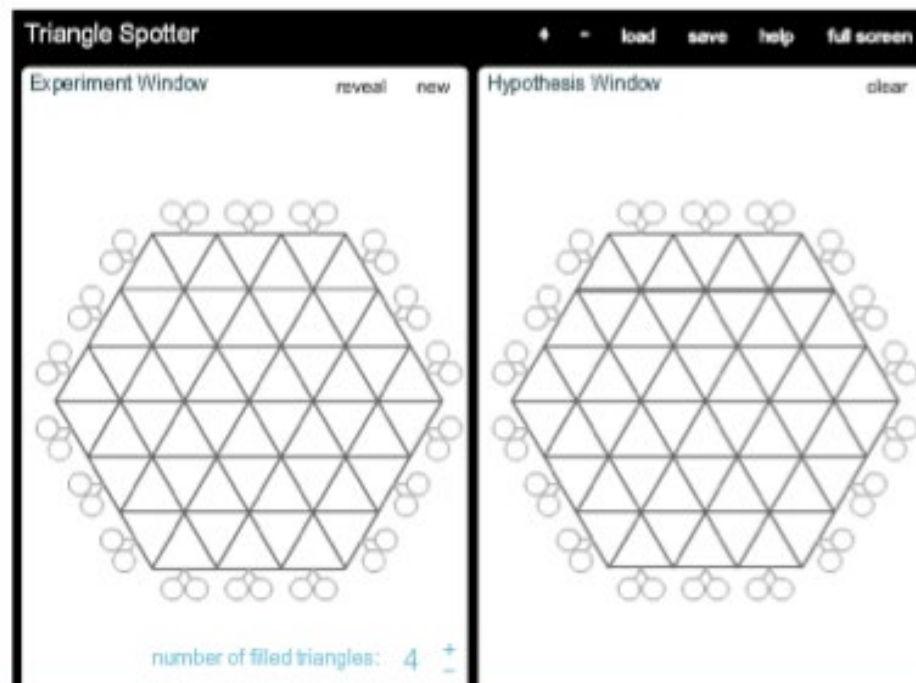
Your challenge is to find the locations of those filled triangles in the grid.

You can fire rays into The White Box and observe where the rays exit using the Experiment Window.

Some rays will pass straight through the Box but some will be deflected by the filled triangles.

You can use the Hypothesis Window to test your ideas. Clicking on a triangle once marks the triangle as empty, clicking again fills it.

[FULL SCREEN VERSION](#)



Science and creativity

Science is not only a body of knowledge to be learned and understood, it represents a powerful method in identifying and solving problems with a significant creative component. Well-planned, structured enquiry is fundamental to science teaching as it reflects the scientific method: curiosity based on existing knowledge, hypothesis

formulation, systematic observation, measurement and experimentation leading to new insights. A deep understanding of the scientific method provides powerful knowledge to students, preparing them for further study in science and helping them to understand applications beyond science. One simple example of enquiry-based learning in science that offers the potential for creative thinking is in Table 14, below.

Table 14: An example of a low-tech tinkering activity: Marble Machines (Winterbottom et al, 2016, p.14)



Cambridge teachers exploring the idea of scientific tinkering

In this activity the participants choose from a wide selection of recycled materials and low-tech tools (for example, scissors, sticky tape, cardboard, elastic bands, pipe cleaners) to achieve the goal of 'getting a marble to move from the top of the pegboard to the bottom as slowly as possible'. The imposed condition 'as slowly as possible' is important. Without it, it's too easy, and the goal is too closed.

Through their explorations, participants may engage in 'engineering' (for example, working out the best materials to create a funnel), 'making' (for example, building a run from cut-up tubes) and 'tinkering' (playfully experimenting with the different materials as they develop their thinking and set new short-term goals).

In a science lesson, this could be a starting activity to help learners to encounter ideas about forces and motion before any of them have been taught the ideas theoretically. By imposing the 'as slowly as possible' condition, learners use intuitive ideas about friction. They also use ideas about rotational movement, linear movement, acceleration and velocity. When they have misconceptions about those topics, this activity can help expose them, and enable the learners to discover that they have misconceptions.

However, most of the time, this is not used in the context of a specific topic in science. It is more there to foster skills, and understanding of the nature of science, including hypothesis setting (albeit informally), testing, controlling for variables and collaboration.

What can we learn from the arts?

Arts subjects such as art and design, music, drama and dance are often associated with creativity and innovation. A broad and balanced curriculum (see Chapter 2) recognises that encouraging the arts can help students to develop their own creative voice and creative thinking skills. Studying an arts subject can also build learners' self-confidence as they feel valued for their unique contributions and talents. When encouraging creativity across the curriculum, it can be useful to look at the ideas and techniques that underpin the teaching of creative subjects such as art, drama and music.

Learner autonomy: Arts subjects can be popular with learners because of the perceived high level of learner choice that is involved. Learners often work on projects that they have devised themselves, according to their own interests and passions. Unique and original work is particularly valued, in both informal and formal assessments. When learners take control of their work in this way, their levels of intrinsic (internal) motivation tend to increase (Craft, 2005, p.56).

Valuing uniqueness: Every learner's outcome will be different in arts subjects. The idea of there being 'no one right answer' is deeply embedded in both the teachers' and the learners' approaches. Although other subjects have more fixed subject matter, it is important for students to learn that there is often more than one correct answer or more than one way to arrive at an answer.

Experimentation and play: In all arts subjects, there is an emphasis on experimentation and 'play'. An art teacher will introduce a technique or material, for example acrylic paint, and learners try it out. This may initially involve copying examples and practising. Boden (2001, cited in Ferrari, Cachia & Punie, 2009, p.19) describes this as 'exploratory creativity', and likens it to a jazz musician learning to improvise based on a defined set of chords or scales. Having developed some degree of skill, learners can then start to experiment and push the boundaries of the material or technique. They may choose to combine it with another technique or idea to produce something that is original to them. Boden calls this 'combinatorial creativity' – the generation of new ideas by combining or associating existing ideas.

There is a role for experimentation and play in all disciplines so that students learn to use their imagination and develop engagement. As in arts subjects, this must be balanced with, and be supportive of, skill development so that it supports students' basic literacies.

Looking at and discussing artworks: The study of artworks is not necessarily limited to art or art history lessons. Images of artworks can be used to prompt thinking in any subject area. Teachers can use carefully chosen artworks to prompt discussions and deeper critical thinking about a topic. Visual Thinking Strategies (VTS), developed by Yenawine (2014, p.25; see the Resources section) uses art to help learners of any age to develop their visual literacy, thinking and communication skills, and is an excellent resource.

Journals, notebooks and sketchbooks: Keeping a notebook, sketchbook or journal is an essential part of an art and design education. All the creative skills can be practised through the discipline of keeping a record of a learner's observations, ideas, reflections and collections. By recording and collecting a wide range of information, a learner can then start to cultivate creative connections between different elements and come up with more unique and original ideas. Notebooks and journals have been used by many great creators, such as the poet Lord Tennyson, who recorded fragments of thought and then generated connected words and images which led to his poetry (Michalko, 2001, p.58). Charles Darwin kept detailed journals on his travels to the Galapagos Islands, and his journals contain a record of his tentative diagrams of the branching system on which he eventually based his theory of evolution. Guy Claxton (2006, p.353) recommends encouraging learners 'to keep a commonplace book... in which they keep scraps of overheard conversation, images, quotes, fleeting thoughts that didn't go anywhere... as most creative writers, scientists, composers do'.

The value of failure: The arts, perhaps more naturally than other subjects, accept and celebrate failure as a learning opportunity and understand that it is an inherent part of the creative process. As West-Knights (2017, p.49) points out: 'One of the mainstays of drama classes... is the notion that mistakes are OK, as long as you are trying things out.'

Peer review and feedback: Peer review sessions (sometimes called group critiques) are commonly used in art and design as a method of informal interim assessment. Learners present their work to small groups of their peers and receive constructive feedback. The process is carefully scaffolded by the teacher, who leads initial sessions, modelling the types of questions and comments that are appropriate. When successful, peer reviewing helps learners to build independence, gain insight into their peers' working and thinking processes, and develop confidence in themselves as creative individuals.

Making connections: mind mapping

As illustrated in figure 6 on page 58, mind maps (sometimes called concept maps or spider diagrams) are a flexible and powerful tool for representing information and nurturing creative and critical thinking. Originally popularised and developed by Tony Buzan in the 1970s, mind maps are designed to 'harness the full range of cortical skills' (Buzan, 1986, p.45) by using key words, colour, images, number, logic, rhythm and spatial awareness.

Mind maps are essentially diagrams that visually organise information. They normally consist of a central concept, which is expressed with a key word or short phrase. Related ideas branch off from this, spreading across the paper, which is usually in landscape format to give the optimum space for ideas to be written. Each main branch that emerges from the central theme can then branch out further to related sub-sections.

The theory of semantic network models (Collins & Quillian, 1969, p.240) helps to explain why mind maps are effective. Each learner has their own unique understanding of any subject at a particular time based on their own personal associations and connections. The act of creatively constructing mind maps requires students to think hard about what they are learning and to build new connections. Learners will find it easier to remember information by building their own personal representation of understanding. It is impossible to create a mind map without active engagement and thinking through the construct being mapped. Building up a large amount of information on a page also encourages creativity. Learners can make connections between topics, which they may not see while studying a dense block of text. Mind maps can be used in a number of ways including:

- Note taking. The act of creating a mind map requires chunking of information and concepts, relating them to each other. This can be helpful both in developing understanding and helping to memorise information. It makes the process of note taking active rather than passive. At the end of a unit, a teacher might ask learners, individually or collaboratively, to create a mind map of what they understand about a topic that has been covered. Many learners find mind mapping a very useful technique when revising for exams, as the process of reformulating their notes into a new structure is in itself a memorable activity.

- Planning essays, presentations or projects. By using key words, learners can fit large amounts of information onto one page, allowing them to get an overview of a topic and to plan information strategically.
- Clarifying, analysing and re-defining problems or questions. This helps learners to uncover new perspectives, to build higher-level thoughts and to develop understanding, analysis, synthesis and evaluation.
- Making connections. This supports the development of holistic and disciplinary understanding through connecting ideas from different topics or different subjects.

Mind maps are an extremely versatile and accessible approach to help visualise and understand material. Many learners, including those who have dyslexia or other learning difficulties, find mind maps very useful, and they can be used to support learning in all disciplines. Research by Park and Brannon (2013, pp.2013–2019) found that training learners to use visual and spatial representations significantly improved their performance in mathematics, even when undertaking numerical problems. Research has shown that mind mapping is more effective as a means of knowledge retention and transfer than attending lectures, participating in class discussions or reading text passages alone (Nesbit & Adesope, 2006, p.434).

For more information on mind maps see the references and resources at the end of this chapter.

Assessing innovation and creativity

As argued already in this chapter, the outcomes of creative processes are incorporated naturally into teaching and learning. Teachers can assess them when students complete an assignment or task and have demonstrated creativity.

Because creativity is a process inherently linked to reflection, it is often valuable to assess progress at appropriate points in the journey. This needs to be done sensitively. If learners or teachers are too critical of ideas during the ideas generation phase, they may find that they dismiss all their ideas and do not have anything to work with.

Creativity lends itself to self-evaluation, peer evaluation, process/progress learning diaries (sometimes called process or progress journals), portfolio assessments, blogs, presentations and exhibitions. As Rachel Logan, Product Manager for Art and Design at Cambridge explains: 'We are assessing how well they have thought "around" a problem, not necessarily how well the solution works.' She adds: 'It's vital that learners have critically evaluated their outcomes, but in the end it's mostly about the process that they went through to get there.'

Ellis and Barrs (2008, p.78) have developed a generic rubric to informally assess creative learning. Rubrics are designed to clarify criteria and standards against which students' work can be assessed. This focuses on the processes involved in creative work, including investigation, skills, discussion, evaluation and reflection. The rubric is intended for use in a primary classroom, but could be adapted for any level.

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Resources

Questioning

Rothstein, D. & Santana, L. (2015). *Make just one change: Teach students to ask their own questions*. Cambridge, MA: Harvard Education Press.

This practical teachers' guide describes the 'question formulation technique' as developed by the authors over several years of working with learners across a range of socio-economic backgrounds, including bilingual learners. The book goes through the strategies step by step and gives examples of how teachers of different subjects have implemented the technique.

Essentially, the strategy is to prompt learners' curiosity with a 'question focus' which could be an image, statement or audio-visual stimulus. Learners then create questions through divergent thinking routines. They then prioritise and improve these questions with help from their teacher. Finally, a range of possible next steps are suggested as to what learners might do with the questions. These include 'do-now' activities,

identifying topics for further research and investigation, preparing for tests, providing formative assessment information for teachers or preparing a research agenda for the next unit of study.

Educating for Creativity: Level 1 Resource Guide

www.creativeeducationfoundation.org/wp-content/uploads/2015/06/EFC-Level-1-FINALElectronic.pdf

This guide from the Creative Education Foundation gives lots of useful tips about how to encourage your learners to solve problems creatively. The creative problem solving (CPS) process is based on the Osborn-Parnes CPS model. There are descriptions of brainstorming-type activities for cross-curricular projects. The ethos behind this model is to encourage an environment in which creativity and innovation can thrive using a range of techniques and strategies. The authors aim to nurture creative skills which will become an integral part of learners' work and life in future.

Buzan, T. (1996). *The Mind Map book*. New York, NY: Penguin.

One of many publications by Tony Buzan that explores the possibilities of mind maps and explains how they are best generated.

De Bono, E. (1993). *Serious Creativity: Using the Power of Lateral Thinking to Create New Ideas*. USA: Harper Business.

Although primarily aimed at a business market, this book contains very detailed descriptions of how to implement Edward De Bono's many lateral thinking tools, including Six Thinking Hats, Provocations, Random Input and more. There are also suggestions for how to run training or set up a creative thinking session, which could easily be adapted for use in schools.

Online resources from Edward De Bono

Edward De Bono's CoRT thinking tools are described in this resource, along with many other ideas for using questions to trigger critical and creative thinking:

www.nsead.org/downloads/Effective_Questioning&Talk.pdf

Instructions and descriptions of De Bono's CoRT thinking tools with examples:

<http://elearnmap.ipgkti.edu.my/resource/gkb1053/sumber/CoRT1-4.pdf>

Simister, C. J. (2009). *The Bright Stuff: Playful ways to nurture your child's extraordinary mind*. Harlow: Prentice Hall LIFE.

This book contains a large number of creative thinking ideas that could be incorporated into all levels of teaching.

Craft, A. (2000). *Creativity across the Primary Curriculum: Framing and Developing Practice*. London: RoutledgeFalmer.

This is an inspiring read, practical but informed by theory and research.

Anna Craft explores core principles and the different subjects, and considers ways in which teachers can develop a more 'creative mindset' towards the curriculum and pedagogy.

www.amazon.co.uk/Unlocking-Creativity-Teaching-Curriculum-Teachers/dp/1843120925

Fisher, R. (2005). *Unlocking Creativity: Teaching Across the Curriculum: A Teacher's Guide to Creativity Across the Curriculum*.

A comprehensive guide to incorporating creative approaches into your lessons.

It has sections on specific subjects including maths, creative writing, drama, science, design technology, geography, music, art and religious education.

Scoffham, S. (Ed) (2004). *Primary Geography Handbook*. Sheffield: The Geographical Association.

This subject-based handbook for teachers has a wealth of tried and practical examples of creativity applied to geography. Chapters on 'Young geographers', 'Geography, creativity and place', 'Geography and the emotions' and 'Making geography fun' show how creative teaching and promoting creative thinking in children is central to a subject not usually thought of as creative.

Yenawine, P. (2014). *Visual Thinking Strategies: Using art to deepen learning across school disciplines*. Cambridge, MA: Harvard Education Press.

An in-depth explanation of visual thinking strategies (VTS) as mentioned in this chapter. This is a teacher's guide to the VTS project, which started as a collaboration between the education team at the Museum of Modern Art, New York and academics at Harvard University. It includes lots of examples of how to implement the strategies as well as written records of typical conversations in classrooms where VTS is being used.

www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03d_UnderstandingRoutines/ThinkPuzzleExplore/ThinkPuzzleExplore_Routine.html

This site contains excellent resources explaining a wide range of thinking routines developed by Harvard Project Zero, including this 'think, puzzle, explore' thinking routine. These activities are easily adaptable to any learning situation for any age. There are also videos of the routines in use in classrooms.

Compass Points thinking routine from Harvard Project Zero:

www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03c_Core_routines/CompassPoints/CompassPoints_Routine.html

Project-based learning resources

www.bie.org/resources

The Buck Institute for Education, USA. This site contains resources and case studies on successful project-based learning.

www.hightechhigh.org/htm/projects

High Tech High in San Diego, USA. Examples of learner projects with learning outcomes and teacher reflections.

<https://jennyluca.com/2012/10/02/project-based-learning-giving-it-a-go-in-an-english-classroom>

This blog explains one English teacher's experiences implementing project-based learning in her English literature classroom, studying Romeo and Juliet.

www.bie.org/object/document/english_learner_scaffolds_for_pbl
English literature project-based learning scaffolding guide.

Tinkering

www.museoscienza.org/tinkering-eu/download/Tinkering-A-practitioner-guide.pdf

This document explains the background behind the tinkering movement, and gives detailed guidance on how to design and implement tinkering activities. Although the examples are design-technology based, they could be adapted for science or art lessons.

www.raeng.org.uk/education/schools/teaching-and-learning-resources/curriculum-resources

The Royal Academy of Engineering (UK) offers a range of resources for teachers of STEM subjects (science, technology, engineering and maths). The lesson plans include topics such as 'Desert', which looks at how people and animals survive

Chapter 4 continued

in the desert. Activities include learners designing a 'fog catcher' based on their understanding of condensation. It includes handouts and resource lists.

Creative thinking for school leaders

This is a more generalised guide to creative thinking, aimed at school leaders: Kamylyis, P. & Berki, E. (2014). Nurturing creative thinking. International Academy of Education, UNESCO.

Creativity through making

<https://www.gse.harvard.edu/news/uk/14/10/learning-making>

<https://www.weareteachers.com/making-matters-how-the-maker-movement-is-transforming-education>

Rubrics for creativity

<https://ccgiftedcollaborative.wikispaces.com/file/view/6+Creativity.pdf>

http://ec.europa.eu/research/science-society/document_library/pdf_06/report-rocard-on-science-education_en.pdf