CONSTRUCTION MANAGEMENT & ENTREPRENEURSHIP
BCV501

Presented By,

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SYLLABUS

MODULE 1:

Planning and Scheduling: Construction project formulation – construction management, define scope – scope management, types of project planning and its management, Statutory and regulatory requirements- layout and building plan approval, contract, Fire and Safety, Quality, Environmental, commencement certificate, legal and public policies.

Schedule management – WBS, Bar Charts, Sequencing and Dependency, Network Diagram, Activity Duration, Critical Path Method, PERT, Case study.

Cost Management - Creating schedules, Assigning Resources, Cost, Evaluation, Optimization and Tracking.

MANAGEMENT

- Characteristics of management
- Functions of management
- Objectives of Management
- Importance and purpose of planning process
- Types of plans

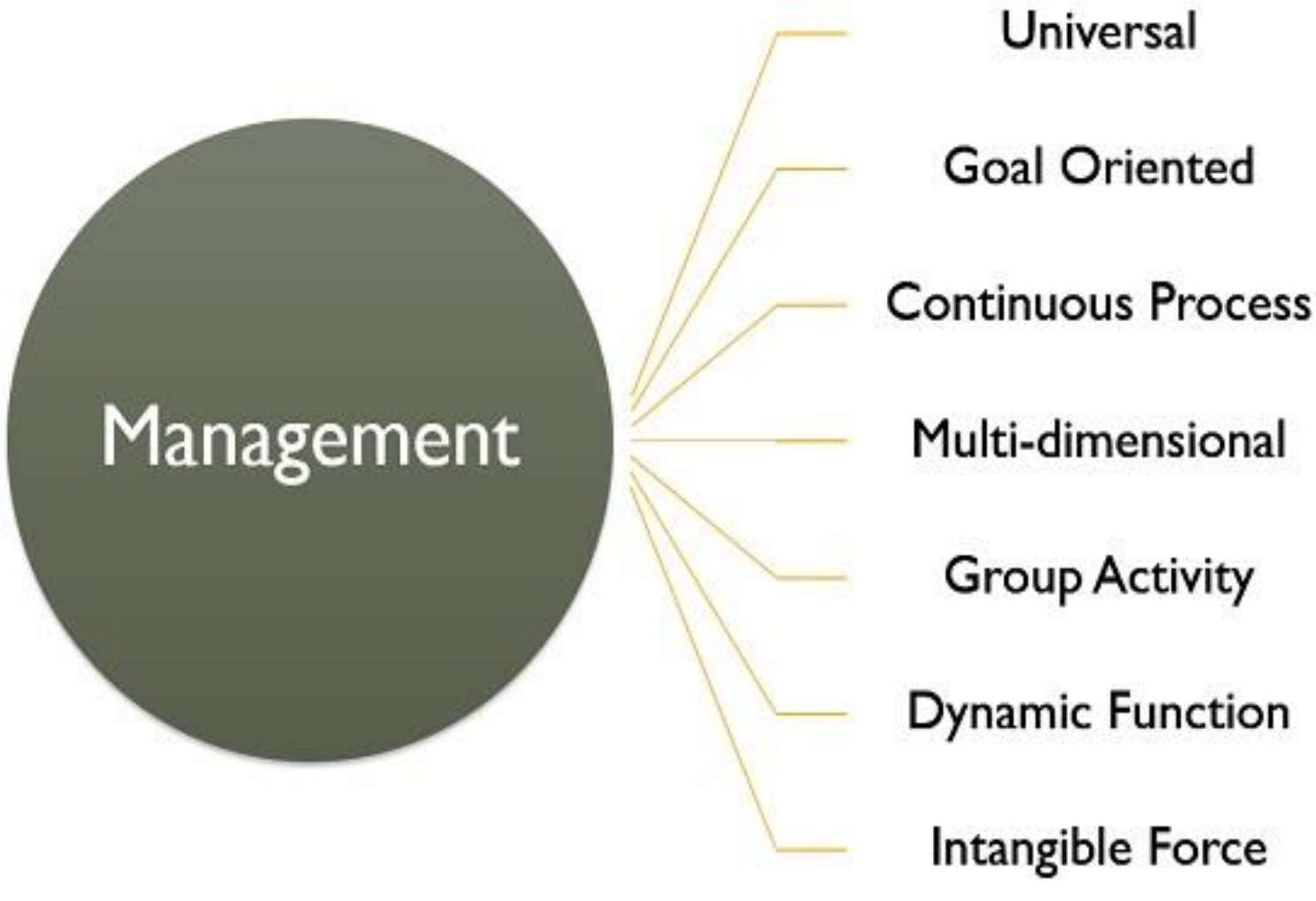
MANAGEMENT

FOUR ASPECTS:

- ECONOMIC PERFORMANCE
- DIRECTING PEOPLE
- DECISION MAKING
- FUNCTIONS

- Management is the art of getting things done through people.
- Management is the process of planning, organizing, leading and controlling the efforts of organization members .
- Management is the process of working with and through others to achieve organizational goals in a changing environment.
- Management is the process of coordinating work activities so that they are completed effectively and efficiently.

CHARACTERISTICS OF MANAGEMENT



FUNCTIONS OF MANAGEMENT

1. PLANNING :

- It is considered as primary function of management.
- It is a function which determines 'what' should be done.
- It is the process of determining the business objective and charting out the methods of attaining it.

2. ORGANIZING:

- It involves in establishing authority – responsibility among the people working in groups.
- Involves creating a structure that facilitates the achievement of goals.
- It consists of Human organization and material organization.

3. STAFFING:

- Involves providing human resources.
- Involves process of recruiting, training, developing, compensating and evaluating employees and maintaining this workforce with proper incentives and motivations.

4. DIRECTING:

- ❑ Process of directing the human resource to perform the necessary tasks as per the plans.
- ❑ It involves important components:

a) Communicating
b) Leading
c) Motivating
d) Supervising

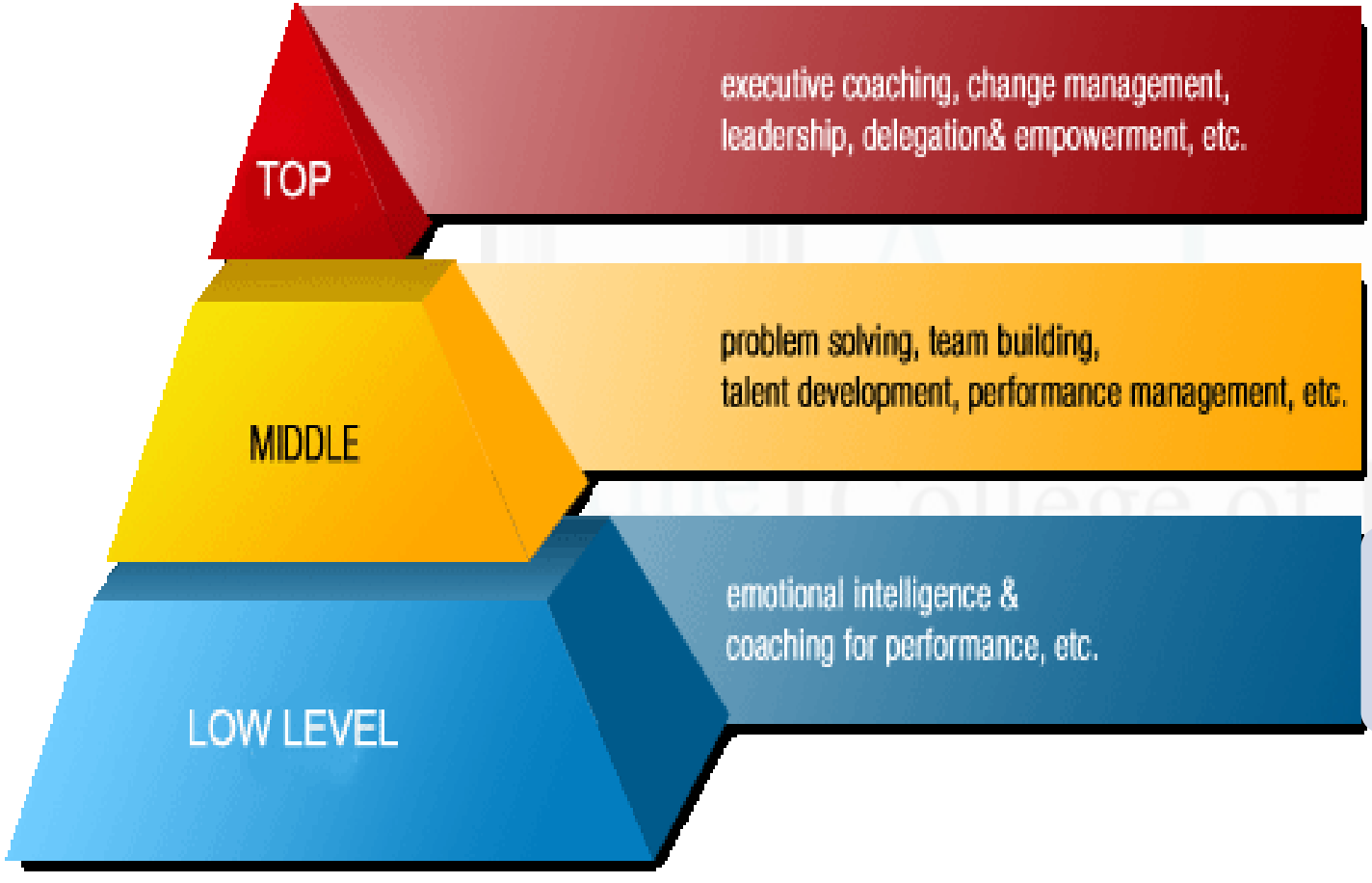
5. CONTROLLING:

- ❑ Establishing standards of performance.
- ❑ Measuring current performance and comparing it against established standards.
- ❑ Taking action to correct any performance that do not meet the objective.

OBJECTIVES OF MANAGEMENT

- **ECONOMIC OBJECTIVE** – Maximizing on profits, growth of company & its survival.
- **SOCIAL OBJECTIVE** – To make available employment opportunities, to save environment from getting polluted, to contribute in improving living standards
- **HUMAN OBJECTIVE-** to ensure a seamless experience for the staff and other people associated with management and accomplish organizational goals. Objectives of HRM include ensuring the availability of resources, easy access to data, on-time payroll, ensuring compliance, etc.
- **NATIONAL OBJECTIVE -** create opportunities for gainful employment of people. This can be achieved by establishing new business units, expanding markets, widening distribution channels, etc.
- **OTHER OBJECTIVES**

LEVELS OF MANAGEMENT



TOP LEVEL — CHAIRMAN

MIDDLE LEVEL — PRINCIPAL/HOD'S

LOW LEVEL — FACULTIES

PLANNING

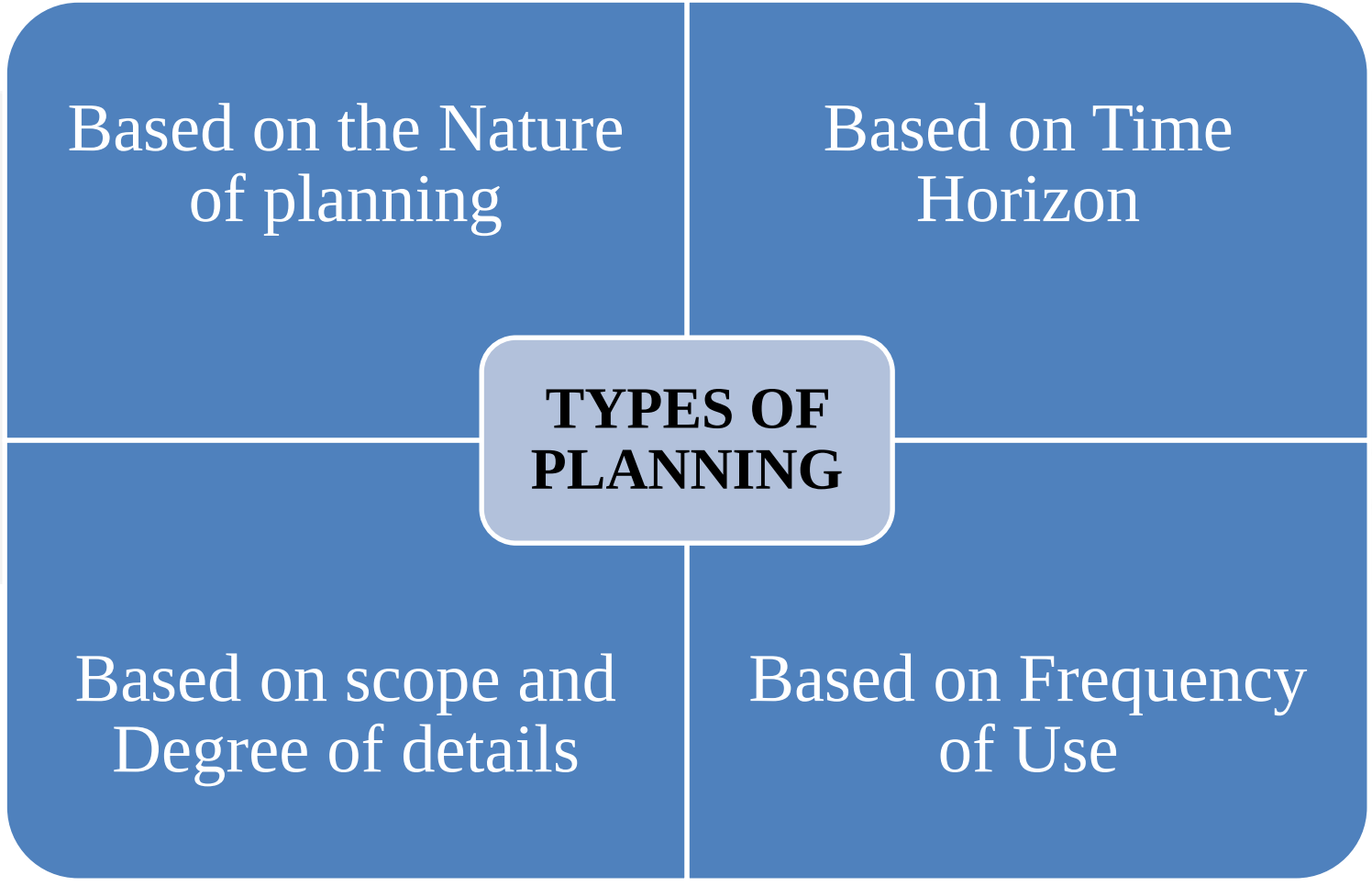
- Planning is fundamentally a mental predisposition to do things in an orderly way, to think before acting, and to act in lights of facts rather than guesses.

Ex:- “Development of academically excellent, culturally vibrant, socially responsible and globally competent human resources”.

CHARACTERISTICS OF PLANNING

IMPORTANCE OF PLANNING

- Reduced uncertainties and Risks
- Better Coordination
- Improved operational efficiency
- Easy implementation of change
- Base for controlling


TYPES OF PLANNING
Based on the Nature of planning
Based on Time Horizon
Based on scope and Degree of details
Based on Frequency of Use

1. Based on the Nature of planning:

- Formal Planning
- Informal Planning

2. Based on Time Horizon:

- Short term Plans
- Intermediate term plans
- Long term plans

3. Based on scope and degree of details:

- Strategic Planning (SWOT)
- Intermediate Planning (Polishing)
- Operational Planning (SHORT TERM)

4. Based on Frequency of Use:

- Single use plans
- Standing Plans

STEPS IN PLANNING

Basic components of Planning:

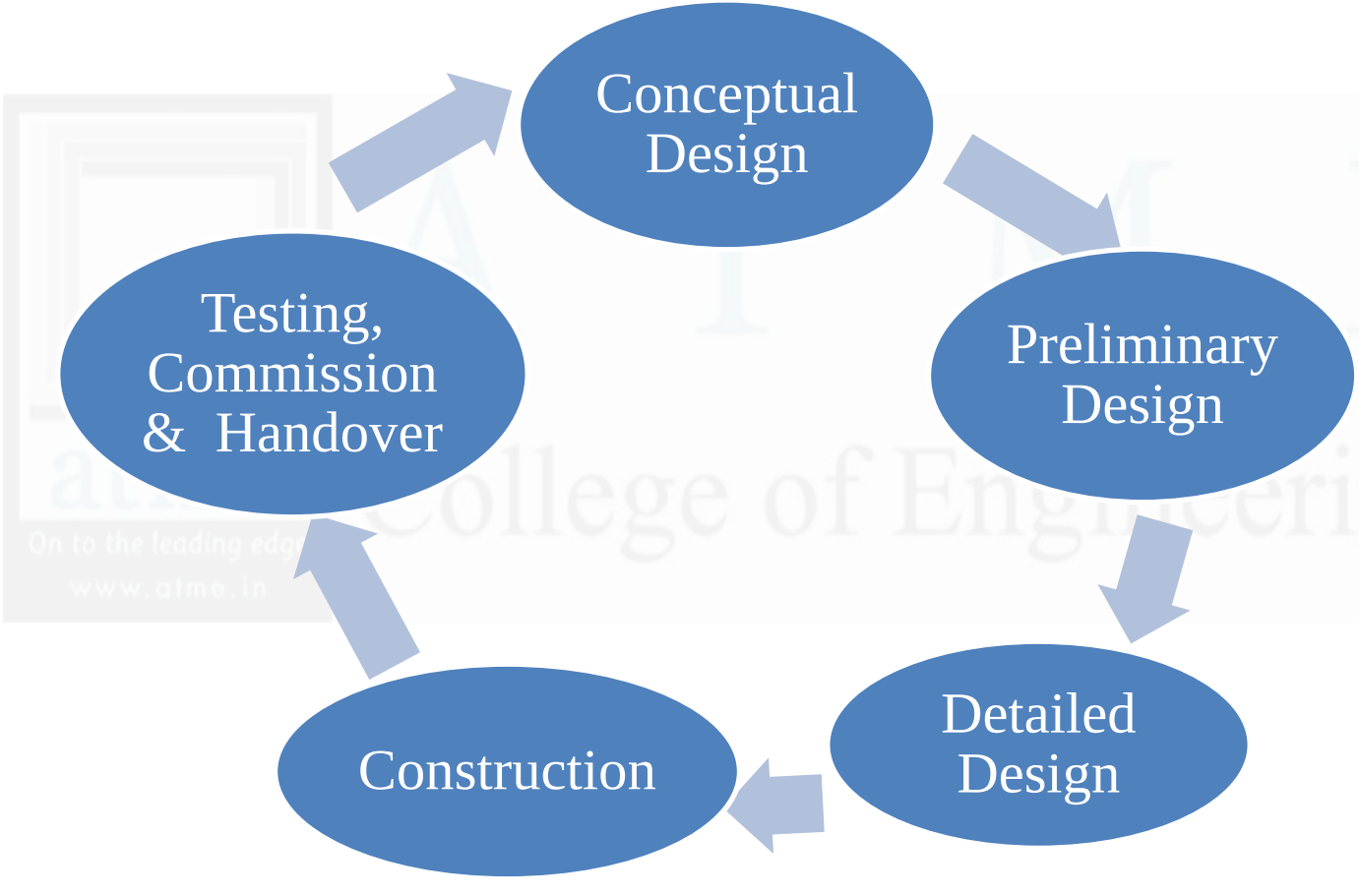
1. Goal: The targets and results that managers hope to achieve.

2. Action Statement: Means by which an organization goes ahead to attain its goal.

CONSTRUCTION PROJECT FORMULATION

- Phase 1: Pre-project Conception and Decision-making
- Phase 2: Project Planning and Design
- Phase 3: Estimating Cost of Labor, Materials & Equipment
- Phase 4: Selecting Contractors
- Phase 5: Project Mobilization
- Phase 6: Operation and Construction
- Phase 7: Termination and Closure

CONSTRUCTION PROJECT FORMULATION

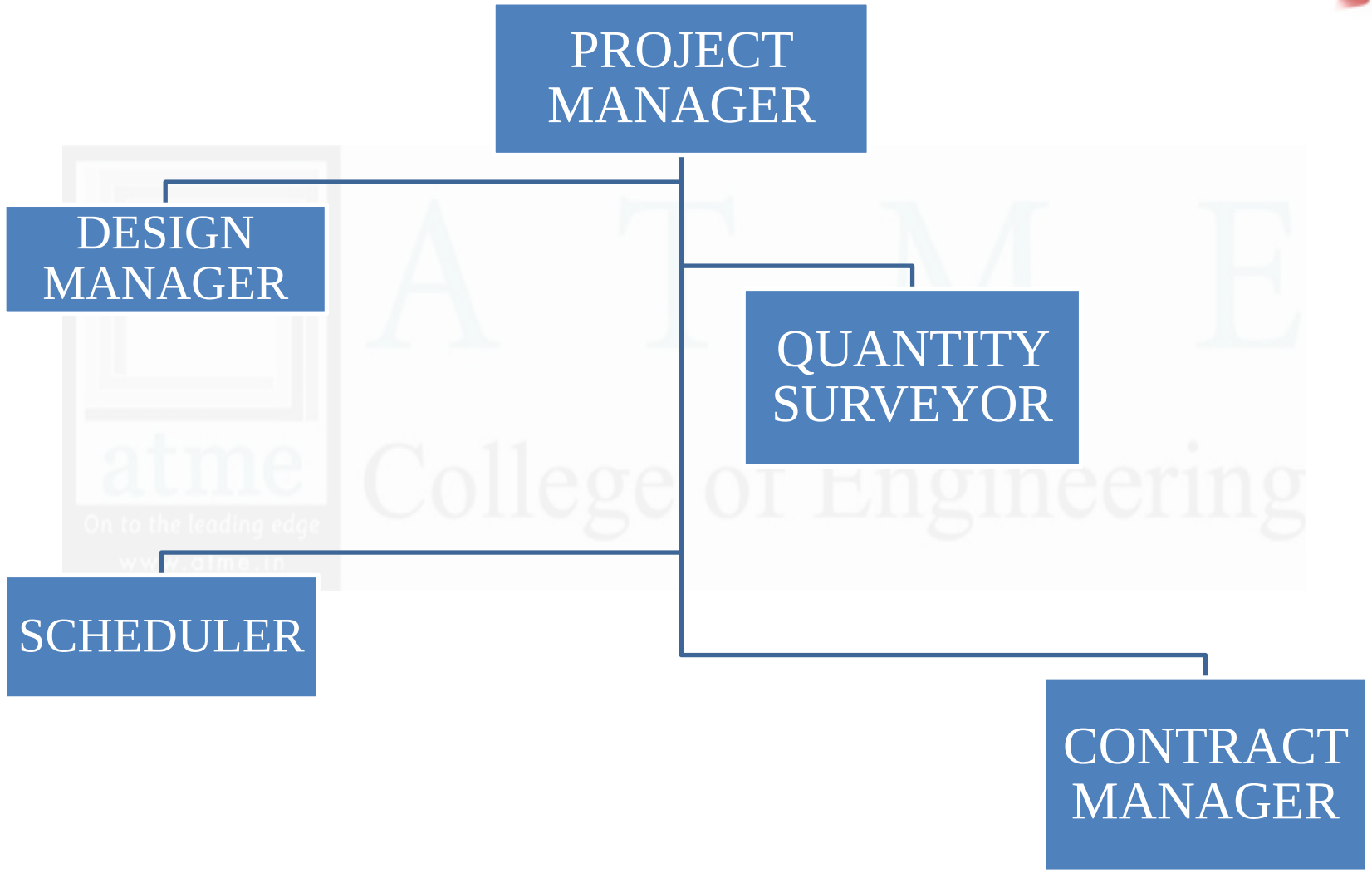


CONSTRUCTION MANAGEMENT

- Construction management comprises of systematic approaches to manage “TRIPLE CONSTRAINTS”.
- Men, Materials, Machinery & Money are the resource in construction management.
- It does not include design or construction services.

IMPORTANCE OF CONSTRUCTION MANAGEMENT

- Maximum production at least cost.
- Optimum utilization of resources.
- Completion of project in time and extracts potential talents.


PROJECT MANAGER
DESIGN MANAGER
QUANTITY SURVEYOR
SCHEDULER
CONTRACT MANAGER

NECESSITY OF CONSTRUCTION MANAGEMENT

- To check the wastage of material and labour.
- To arrange the completion of work in minimum possible time.
- To improve the quality and speed of work by using modern equipment.
- To effect the economy in the cost of construction

OBJECTIVES OF CONSTRUCTION MANAGEMENT

- Proper planning and organizing.
- Work should be executed as per specifications (Prescriptive, Performance, Proprietary).
- Work should be properly supervised by qualified and trained staff.
- Work should be executed economically.

PROJECT ORGANIZATION

Principles

1. Objectives
2. Specialization
3. Co-ordination
4. Authority & Responsibility
5. Span of control
6. Balance
7. Principle of continuity
8. Uniformity
9. Unity of command
10. Efficiency

ADVANTAGES OF ORGANISATION

- Prevents duplication of work
- Minimizes conflict between individuals
- It aids in wage salary and administration
- Permits expansion with adequate control

TYPES OF ORGANIZATION

1. Line or Military Organization

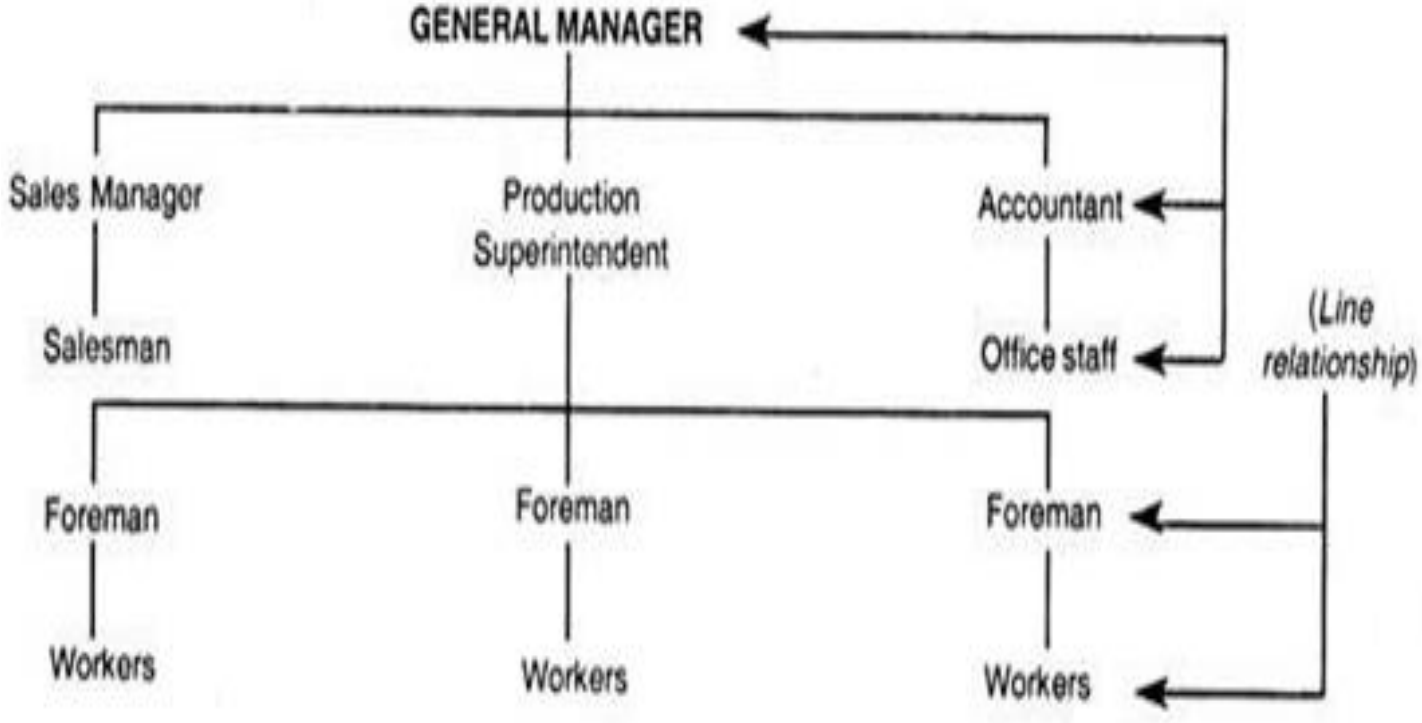
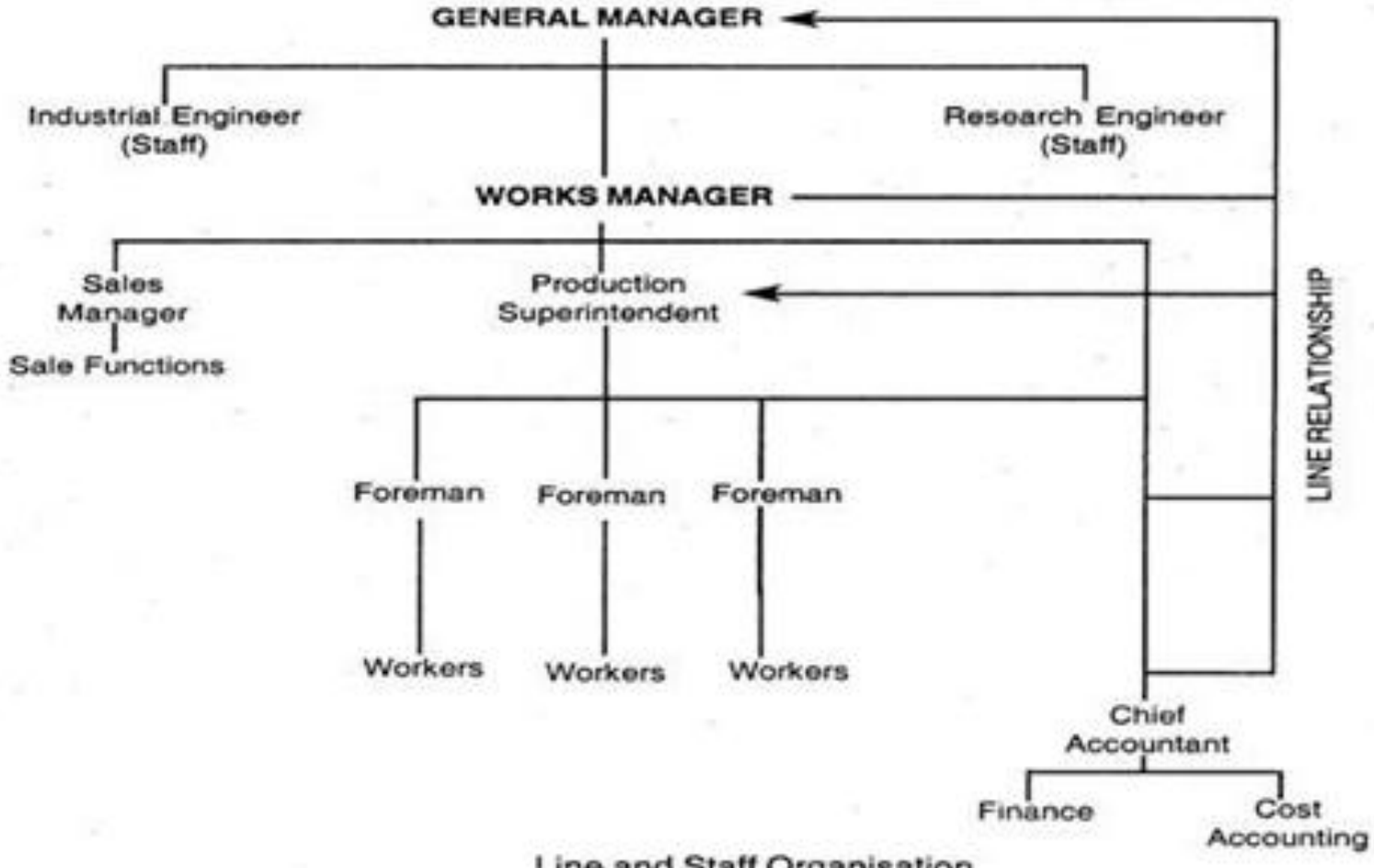


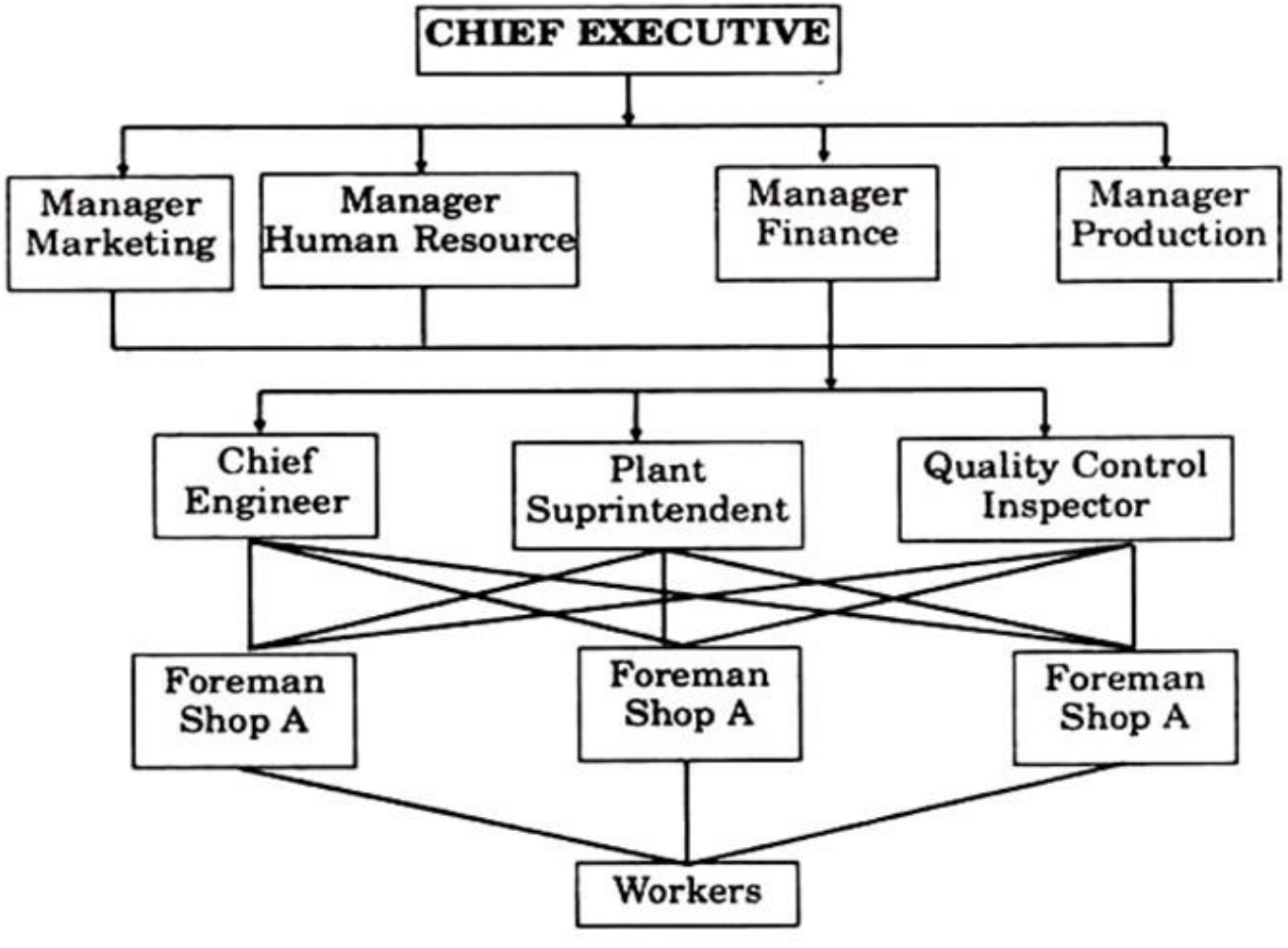
Chart of Line Organisation

2. LINE AND STAFF ORGANIZATION

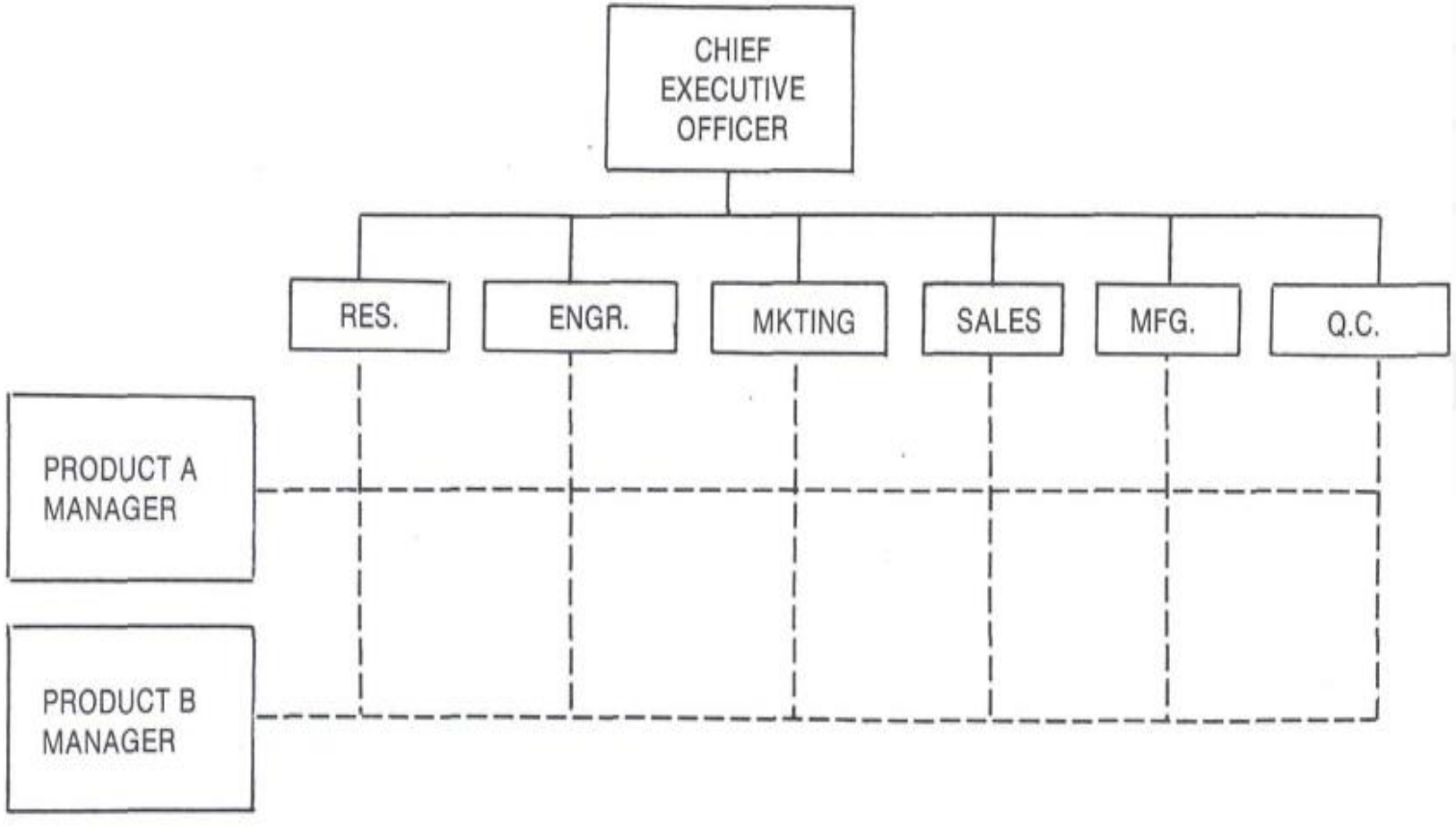


Line and Staff Organisation

3. FUNCTIONAL ORGANIZATION



4. MATRIX ORGANIZATION



MANAGEMENT FUNCTIONS (CONSTRUCTION PROJECT)

1. Project Management Planning
2. Cost Management
3. Time Management
4. Quality Management
5. Contract Administration
6. Safety Management

MANAGEMENT STYLES

1. **Autocratic or Authoritarian Style:** A manager who tends to make unilateral decision and centralizes authority.
2. **Democratic or Participative style:** A manager who tends to involve the group in decision making.
3. **Laissez – fair or Free Rein style:** A manager who generally gives the group complete freedom.

DIFFERENCE BETWEEN AUTOCRAT & DEMOCRAT

Sl.No	Autocrat	Democrat
1.	It leans on authority	It leans on commitments
2.	Requires no input, makes every decision	Requires input and suggestions for making decisions
3.	Discourages workers by threat	Encourages workers by developing trust
4.	Thorough knowledge is must	Leans from subordinates
5.	It shifts the reason of failure/problems	It solves the problem
6.	Reties on controls	Depends on goals
7.	It fires others	It inspires others

CONSTRUCTION PLANNING & SCHEDULING

- Types of project plans
- Work breakdown structure
- Grant chart
- Preparation of network diagram

OBJECT OF PLANNING

- To execute work in an organized and structured manner.
- To reduce rework.
- To establish quality standards.
- To know duration of each activity.
- Procurement of materials in advance.

PRINCIPLES OF PLANNING

- The plan should provide information in a readily understandable form.
- Plan should be realistic.
- Plan should be flexible.
- Plan should be comprehensive.

ACTIVITIES INVOLVED IN CONSTRUCTION PLANNING

1. Defining the scope of work
2. Identifying activities involved
3. Establishing project duration
4. Defining procedures for controlling and assigning resources
5. Developing appropriate interfaces
6. Updating and revising plans

TYPES OF PROJECT PLANS

1. Project Conceptual plan
2. Project preliminary plan
3. Detailed construction plan
4. Time plan
5. Manpower plan
6. Material plan
7. Construction equipment plan
8. Finance plan

SCHEDULING

- It is a mechanical process for setting the various planned activities in order by fixing the starting and finishing dates of each activity.
- Construction, Material, Labour, Equipment and Expenditure are different types of Scheduling

TYPES OF SCHEDULE

1. Construction schedule
2. Labour schedule
3. Material schedule
4. Equipment schedule
5. Expenditure schedule

This term expresses two types of requirements:

(i) Statutory requirements

(ii) Regulatory requirements

Both statutory requirements and regulatory requirements are those requirements that are required by law. These requirements are non-negotiable and must be complied with. Failure to comply a legal requirement may result in a fine or penalty and possibly a custodial sentence for the person or persons responsible or organization for such failure.

- *"Statutory refers to laws passed by a state and/or central government, while regulatory refers to a rule issued by a regulatory body appointed by a state and/or central government."*
- Statutory requirements are those requirements which are applicable by virtue of law enacted by the government.
- These are enacted by passing the law in the legislative assembly or parliament. A regulatory requirement can be termed as administrative legislation that constitutes or constraints rights and allocates responsibilities.
- It is somewhat different from the statutory legislation and there can be following types of regulations applicable on an organization

The term ‘statutory and regulatory requirements’ has been used in **0.1 General** of this standard, which states, ‘The potential benefits to an organization of implementing the quality management system based on this international standard are i) the ability to consistently provide products and services that meet the customer and applicable statutory and regulatory requirements.

Statutory Requirements

•**Building Codes:** Compliance with national and local building codes that dictate design, safety, and construction standards.

•**Zoning Laws:** Adherence to zoning regulations that determine land use, building height, density, and setbacks.

•**Environmental Regulations:** Assessment of environmental impact and compliance with regulations such as the National Environmental Policy Act (NEPA) or local equivalents.

•**Health and Safety Regulations:** Ensuring that plans meet public health and safety standards.

Regulatory Requirements

•**Planning Permission:** Obtaining the necessary permits from local planning authorities before beginning construction.

•**Site Inspections:** Scheduled inspections during construction to ensure compliance with approved plans and codes.

•**Occupancy Permits:** Securing occupancy permits to confirm that the building is safe and habitable once construction is completed.

Layout Building Plan

•**Design Submission:** Preparing and submitting detailed architectural and engineering plans that include site layout, floor plans, elevations, and sections.

•**Compliance with Guidelines:** Ensuring that the design aligns with local guidelines on aesthetics, historical preservation, and community standards.

•**Public Consultation:** Engaging with the community, if required, to address concerns or objections regarding the proposed development.

Approval Process

•**Application Submission:** Submitting a formal application to the relevant authorities along with all required documentation and fees.

•**Review Period:** Undergoing a review period during which authorities assess the plan for compliance with all applicable codes and regulations.

•**Approval or Denial:** Receiving official approval or denial, often with stipulations or conditions attached.

Contractual Requirements

•**Contractual Obligations:** Drafting contracts that outline the responsibilities of all parties involved, including architects, contractors, and subcontractors.

•**Insurance and Bonds:** Ensuring that necessary insurance (liability, worker's comp) and bonds (performance, payment) are in place to protect against potential risks.

•**Compliance Clauses:** Including clauses that require adherence to all statutory and regulatory requirements as a condition of the contract.

WORK BREAKDOWN STRUCTUTRE

- Converts Project objectives to specific deliverables.
- It is a technique in project management where the project is broken down into the manageable chunks.
- Task oriented family tree.
- WBS divides and subdivides a project into different components.
- Planning =

  (Work breakdown + Work Sequencing)

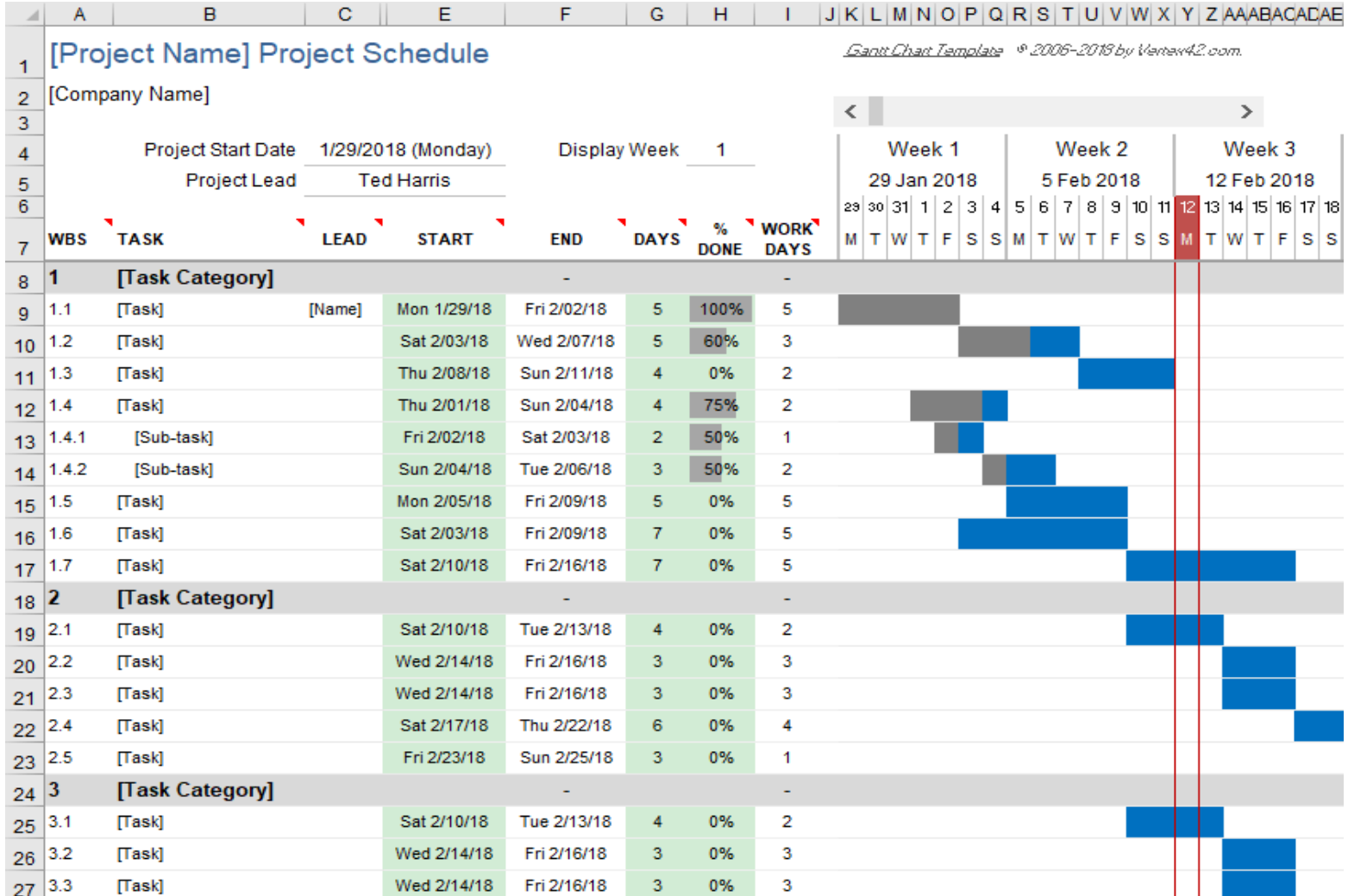
CLASSIFICATION OF PROJECT WORK BREAKDOWN LEVELS

1. SUB PROJECT LEVEL
2. TASK LEVEL
3. WORK PACKAGE LEVEL
4. ACTIVITY LEVEL

METHODS OF SCHEDULING

- GANTT CHARTS & BAR CHARTS
- MILESTONE CHARTS
- NETWORK ANALYSIS

GANTT CHARTS



[Project Name] Project Schedule

Gantt Chart Template © 2006-2018 by Vertex42.com.

[Company Name]

Project Start Date: 1/29/2018 (Monday) | Display Week: 1

Project Lead: Ted Harris

WBS	TASK	LEAD	START	END	DAYS	% DONE	WORK DAYS
1	[Task Category]			-			-
1.1	[Task]	[Name]	Mon 1/29/18	Fri 2/02/18	5	100%	5
1.2	[Task]		Sat 2/03/18	Wed 2/07/18	5	60%	3
1.3	[Task]		Thu 2/08/18	Sun 2/11/18	4	0%	2
1.4	[Task]		Thu 2/01/18	Sun 2/04/18	4	75%	2
1.4.1	[Sub-task]		Fri 2/02/18	Sat 2/03/18	2	50%	1
1.4.2	[Sub-task]		Sun 2/04/18	Tue 2/06/18	3	50%	2
1.5	[Task]		Mon 2/05/18	Fri 2/09/18	5	0%	5
1.6	[Task]		Sat 2/03/18	Fri 2/09/18	7	0%	5
1.7	[Task]		Sat 2/10/18	Fri 2/16/18	7	0%	5
2	[Task Category]			-			-
2.1	[Task]		Sat 2/10/18	Tue 2/13/18	4	0%	2
2.2	[Task]		Wed 2/14/18	Fri 2/16/18	3	0%	3
2.3	[Task]		Wed 2/14/18	Fri 2/16/18	3	0%	3
2.4	[Task]		Sat 2/17/18	Thu 2/22/18	6	0%	4
2.5	[Task]		Fri 2/23/18	Sun 2/25/18	3	0%	1
3	[Task Category]			-			-
3.1	[Task]		Sat 2/10/18	Tue 2/13/18	4	0%	2
3.2	[Task]		Wed 2/14/18	Fri 2/16/18	3	0%	3
3.3	[Task]		Wed 2/14/18	Fri 2/16/18	3	0%	3

Week 1 — 29 Jan 2018: 29 30 31 1 2 3 4 (M T W T F S S)

Week 2 — 5 Feb 2018: 5 6 7 8 9 10 11 (M T W T F S S)

Week 3 — 12 Feb 2018: 12 13 14 15 16 17 18 (M T W T F S S)

- They are very easy to understand and follow.
- They relate activities and their durations to calendar days.
- They don’t show the interrelationship among the activities (Impact of delay).

NETWORK ANAYSIS

- AOA (Activity on Arrow)
- AON (Activity on Node)

NETWORK TYPES:

- CPM Network (Critical Path Method)
- PERT Network (Program Evaluation Review Technique)

$$t_e = \frac{t_o + 4t_i + t_p}{6}$$

ACTIVITY ON ARROW (AOA)

Example: Project Wall Construction

This can be broke down to

Earth Work = 2 days

Brick Work = 6 days

Plastering = 2 days

Total time = 10 days

AOA representation of this Project

ACTIVITY ON ARROW (AOA)

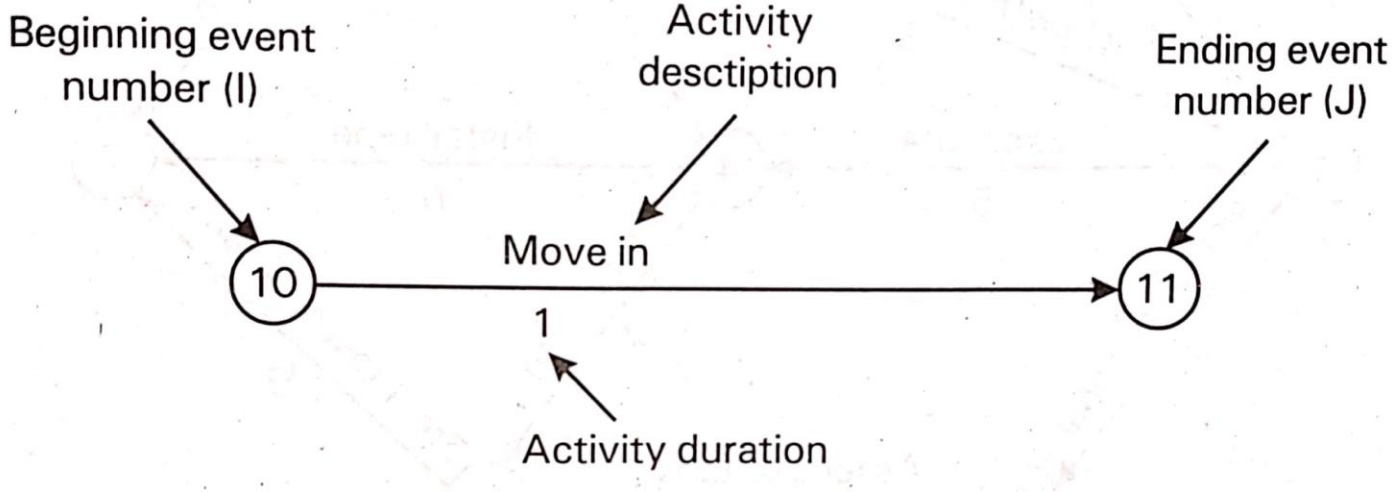


Fig. 1.15(a) : Activity-on-arrow notation

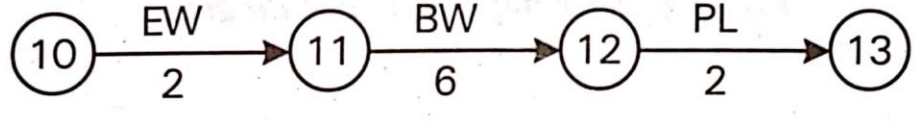


Fig. 1.15(b): Example of AOA network

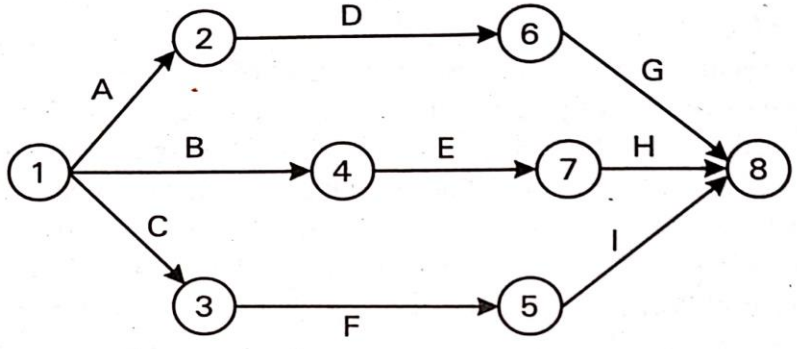


Fig. 1.17 : Several activities starting from Node 1 and terminating at Node 8

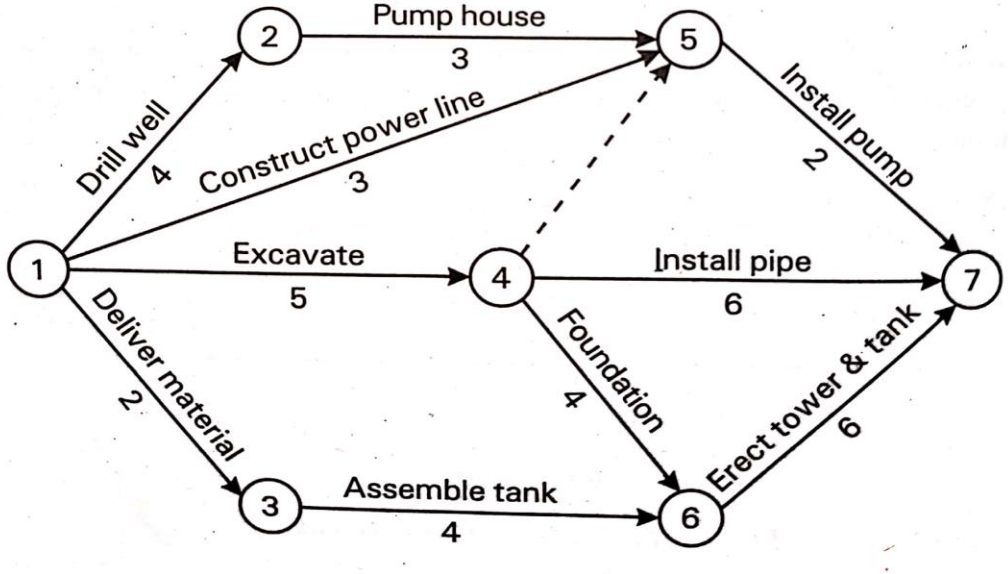


Fig. 1.18 : Example network diagram

ACTIVITY ON NODE (AON)

In this type of Network, the activities are denoted by circles or Boxes called nodes, and the immediate predecessor relationship between the two activities is shown by an arrow connecting the two nodes.

ACTIVITY ON NODE (AON)

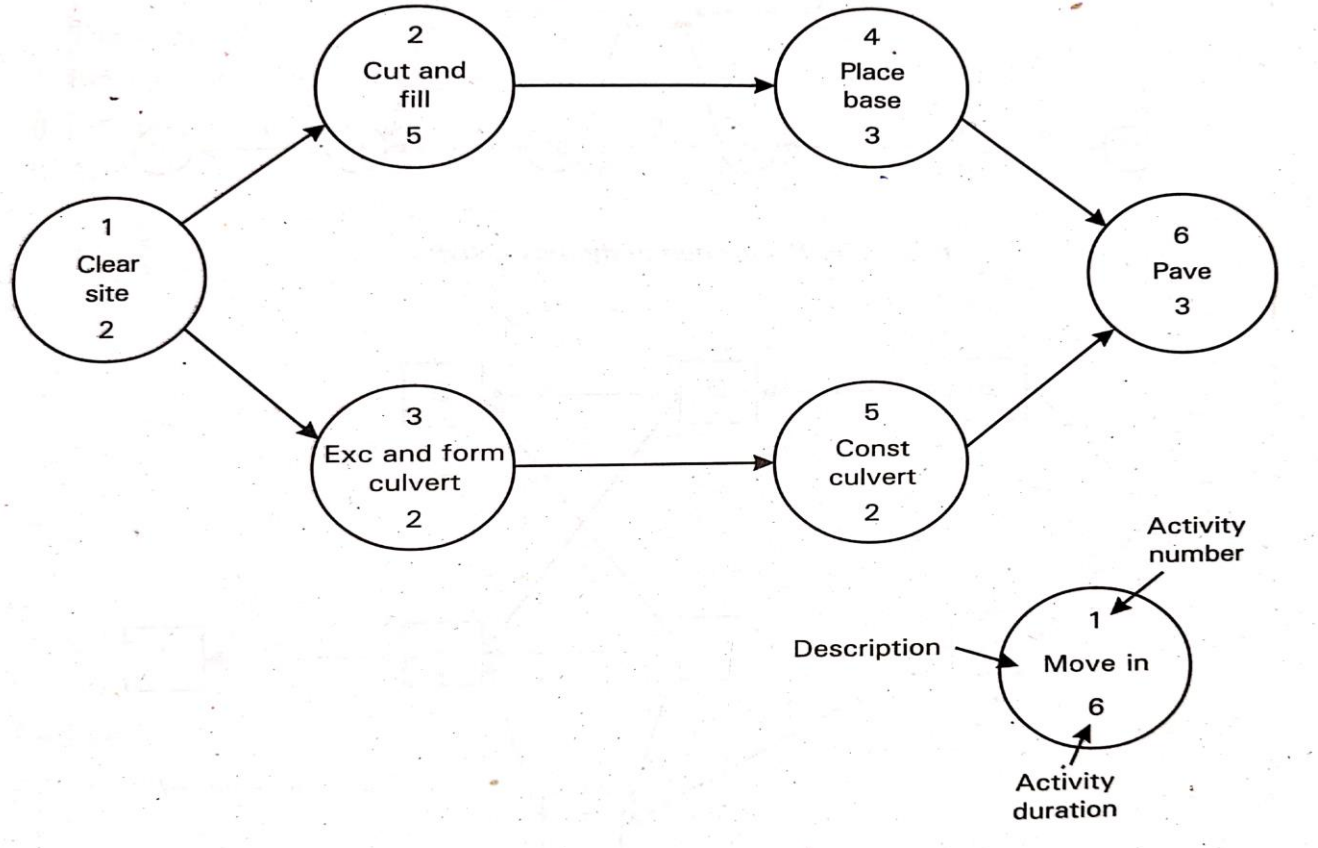


Fig. 1.19 : Circle diagram for a project

CPM	PERT
It’s a activity oriented	It’s a event oriented
Projects of known magnitude	Projects under research work
Duration of the each activity can be determined	It cannot be
Applied to construction	Research & Development Industry
Cost is the direct controlling factor	Time is the controlling factor