POWER POINT PRESENTATION
ON
MANAGEMENT SCIENCE

III B. Tech I semester (JNTUH-R15)

Prepared

By

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- **Introduction to Management**: When human being started group activities for the attainment of same common objectives whenever a group
- formed and a group activity is organized to achieve certain common objectives management is needed to direct, co-ordinate and integrate the individual activities of a group and secure teams work to accomplish organizational objectives. The objectives of all business are attained by utilizing the scare resources like men, materials, machines, money etc.
-
- In process of management, a manage uses human skills, material resources and scientific methods to perform all the activities leading to the achievement of goods.
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Definition:

- "Management is knowing exactly what you want men to do and then seeing that they do it the best and cheapest ways".

- __F.W.Taylor "Management is defined as the creation and maintenance of an internal environment in an enterprise where individuals working together in groups, can perform efficiently and effectively towards the attainment of group goals".
- __Koontz and O'Donell

Nature of Management:

- Multidisciplinary
- Dynamic nature of principle
- Relative, not absolute principles:
- Management Science or Art:
- Management as profession

Characteristics of Management

- Setting goals for organizations:
- Awareness of opportunities and resources:
- Management is transformation process
- System of authority: System of authority means a hierarchy of command and control. Managers at different levels possess varying degrees of authority.
- Co – Ordination:
- Management is Dynamic:
- Management is decision making:
- Management is a profession:
-

Levels of Management

- Top Management
- Upper Middle management
- Middle Management
- Lower Management
- Operating Force or Rank and file workmen

Functions of Management

- PLANNING
- ORGANISING
- STAFFING
- Directing
- Controlling

Organization

- Organization refers to the institution where in the management functions are performed

- **Organizing**: is one of the functions of management means to achieve the plans.

Basics concepts related to the organization

- Organizational Hierarchy
- Authority and Responsibility

Authority is the power to give commands and to use discertion vested in that particular position or Job.

Responsibility is the obligation on the part of the subordinate to complete the given job.

Basics concepts related to the organization

- Delegation of Authority

  The process of transferring authority from top to the lower levels in the organization is called delegation.

Two types of Delegation

1. Centralized
2. De-centralized

- Span of Management

  Number of all kinds of relationships (N)=n(2n-1+n-1)

Where n=number of subordinates reporting to a manager

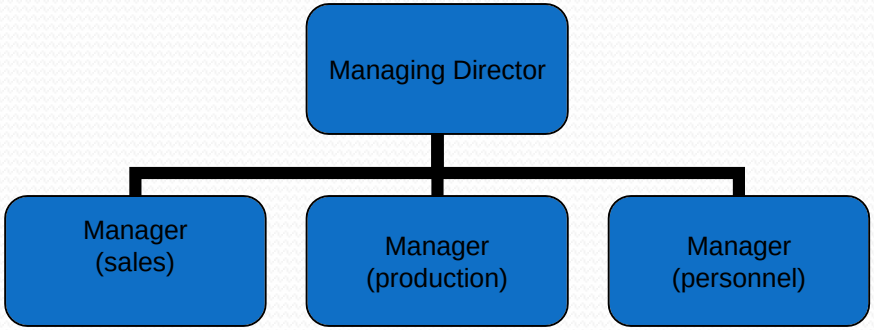
Basics concepts related to the organization

- Flat and Tall organizations

Flat organization:-Which have relatively few or even one level of management.

Flat is also known as wider span of control

Flat organization

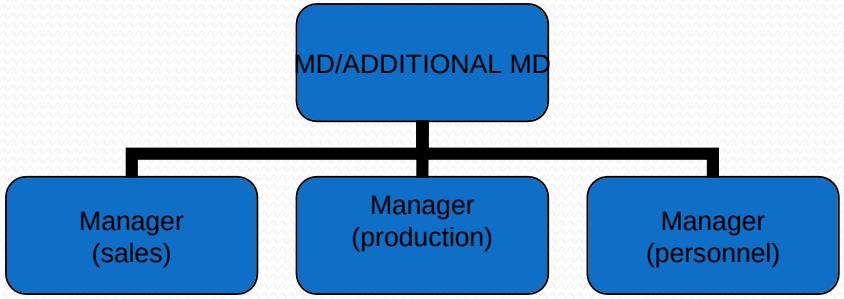


Basics concepts related to the organization

Tall organization:-have many levels of management

-involves narrow span of management

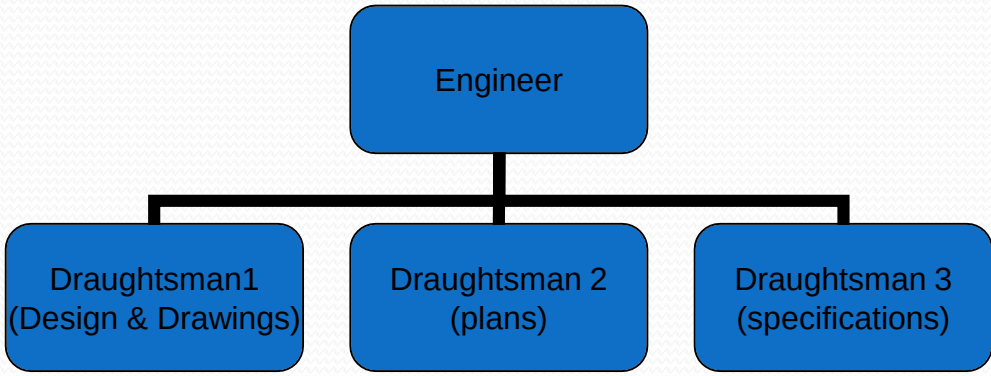
Tall organization



Types of Organizations

1.Line organizations:- is also called military or scalar organization. is said to be the oldest and most traditional type of organizations. Managers in this organizations have direct responsibility for the results.

Line organization



2.Line and Staff Organization:-

- Drawn from earlier civilisation and armies.
- Staff managers support the functions of the line managers.
- Line and staff organization is a service organization.
- Line and staff organization in a manufacturing unit.
- Line and staff in the armed forces.
- Line relationships in staff positions.

3.Functional organization:-

- F.W.Taylor suggested functional organization in his theory of Scientific management in support of his ‘one best way’ of doing things.
- The planning and implementation tasks are divided to ensure the division of labour.
- The foremen involved in the planning task.

4.Committee Organization:-

- A committee is formed when two or more persons are appointed to work as a team to arrive at a decision on the matters referred to it.

5.Matrix organization:-

- Also called Project organization.
- It is a combination of all relationships in the organization vertical, horizontal and diagonal.
- It is mostly used in complex projects.
- It provides a high degree of operational freedom.

6.Virtual Organization:-

- Virtual organization structure does not physically exist, but its effect is felt.
- Example: Bata Shoes

Merits:-

- Enable for doing business with less capital, less HR and other inputs.
- Provide flexibility of operations.
- React to the environment demands most efficiently.

7.Team Organization Structure:-

- Team structure takes three forms

1. Project team
2. The task force team
3. Venture team

Principles and types of Plant Layout

Plant Layout:- is physical arrangements, either existing or in industrial facilities.

Mainly plant layout begins with plant location.

Objectives:

- Economics in handling materials, semi-finished and finished goods.
- Proper and efficient utilization of available floor space.
- Provision for better supervision and control.
- Careful planning
- To provide adequate safety
- To meet the quality and capacity requirements.
- Provision for medical and cafeteria at suitable and convenient places.

Advantages of good layout:-

- Economies in handling.
- Effective use of available area.
- Minimizes production delays.
- Improves quality control.
- Avoids bottlenecks.
- Controls production in a better way.
- Better supervision.
- Improved utilization of labour
- Improves employee morale.
- Avoids unnecessary and costly changes.

Types of layouts:-

1. Product layout
2. Process or functional layout
3. fixed layout

Product layout:-

- This layout is followed by only by such industries where the product decisions are finalized and may not change at least in the near future. It is because a change in the product will call for a change in the plant layout.

Process or functional layout:-

- The equipment is arranged as per the nature or types of the given set of products operations major it is called process layout.

Fixed layout:-

- The manufacturing facilities are fixed in their position. They cannot be shifted from one place to another place. This type of layout is used in case of large projects.

Methods of production:-

Production:-is an act of transformation

i.e inputs are processed and transformed into some output.

Methods of production:-2 types

1. Intermittent or interrupted production
2. Continuous production

Intermittent or interrupted production:-

- The goods are manufactured specially to fulfill the order made by the customers rather than for stock.
- This is of two types

1. Job production
2. Batch production

Job production:-

- This is the production of single complete unit by one operator or group of operators.

Ex:-Construction of a bridge, construction of dam, ship building etc

- In this process goods are produced to definite customers orders.
- Each production is a class by itself and requires a distinct and separate job for production purposes.

Characteristics of job production:-

- Whole project is taken as a single operation
- Work is to be completed on each product before processing the next item
- Skilled labor are required
- High capital investment is required
- Control of operations is simple
- Cost of production per unit is high.
- Sometimes special machinery & special training is required.

Batch production:-

- The production schedule can be chalked out according to specific orders or on the basis of demand forecasts.
- In batch system new batch is undertaken for production only when the work on all items of a batch is complete.

Ex:-Pharmaceuticals, ready made garments,

Paints, mineral water bottles.

Characteristics of batch production:

- Products are manufactured in batches as per the specific order produced
- Division of labor is possible
- Flow of material is continuous
- Process layout is used
- Automation of processes and mechanization of materials handling can be done
- Maintenance of equipment and machinery is essential
- Process and product planning is done for each batch.

Continuous production:-

- In this system items are produced for the stocks and specific orders.
- In continuous manufacturing systems each production run manufacturers in large lot sizes and the production process is carried on in a definite sequence of operation in a pre-determined order.
- This is of one type

  1.Mass production

Mass production:-

- Also called as flow production
- The production can be undertaken on large and specialized machines and processes.

Characteristics:-

- Mechanization and division of labor
- Large-scale economies
- Sophisticated material handling systems to minimize the cost
- Work study techniques
- ISO 9000 like sophisticated quality control techniques.

Work study:-

- According to British Standard (BS 3138), work study refers to the method study and work measurement which are used to examine human work in all its contexts by systematically investigating into all factors affecting its efficiency and economy to bring forth the desired improvement.

Benefits:-

- Directly leads to standardization of the job processes
- Determines cost of the work performed
- It saves the time
- Contributes to cost savings
- Enhances the employee morale
- Facilitates the organization to plan and achieve work targets
- Enhances the productivity of all workers and machines
- Helps to evaluate the department performance

Components of work study:-

- Method study
- Work measurement

Method study:-

Is also called as Motion study.

Method study is the systematic recording and critical examination of the existing and proposed ways of doing work.

Basic procedure of method study:-

- Aim: to develop better working methods
- Select: the task to be studied
- Record: all related facts
- Examine: the critical facts should be examined
- Develop: the best possible method
- Define: the best method so developed
- Install: the new method
- Maintain: the installed method
- Result: increased efficiency, cost effectiveness and good productivity

Work measurement:-

- Also called Time study, establishes the time taken by a qualified worker to complete a specified job at a defined level of performance.
- Time measuring devices:-

1. Stop watch
2. Motion picture camera
3. Time recording machine
4. Electronic timer

Statistical Quality Control:-

- Quality is some prescribed or desired characteristics present in raw material, semi-finished or finished goods.
- Control is the process of verification or correction of the product when the deviations in the quality are found to be more than expected.
- Quality control is of great value to both producer and customer
- SQC is applied by taking samples and drawing conclusions by means of some mathematical analysis.

Definition:-

- Material refer to inputs into the production process, most of which are embodied in the finished goods being manufactured.

Objectives:-

- To support the production departments with materials.
- To minimize investments.
- To avoid accumulation of work in process.
- To maintain adequate inventories.
- To contribute direct profitability.
- To ensure economy of costs by processing EOQ

Need for Inventory control:-

Inventory:-refers to all the idle physical stocks, which have economic value.

Inventory control:-is defined as the scientific method of providing the right type of material at the right time in the right quantities and at right price to sustain the given production schedules.

Need for Inventory control:-

- Minimizing investments for the organization (in case of materials)
- Maximizing the service levels to the customers

Economic Order Quantity (EOQ):-

- EOQ is defined as that quantity of material, which can be ordered at one time to minimize the cost of ordering and carrying the stocks.
- $EOQ=\sqrt{2Ao/c}$

Where A=Annual Demand

O=Ordering cost per order

C=Carrying cost per unit

ABC Analysis:-

ABC------ Always Better Control of inventory

- ABC analysis is a technique of controlling inventories based on their value and quantities.

According to this analysis inventory is divided into three categories—A, B and C—based on their respective value

ABC Analysis:-

- A ---- Very costly and valuable —strict control – day to day
- B ---- less costly ---- moderate control – weekly
- C ---- least cost ---- low control

  - monthly

Purchase Procedure:-

- Purchasing is a specialized job.

Objectives:-

- To purchase the right quantity and quality of materials.
- To ensure continuous flow of supplies.
- To explore and develop other sources of supply.
- To obtain the best value for the money spent.
- To maintain functional relations.
- To train staff, make policies and procedures.

Purchasing process:-

- Requisitioning purchases
- Exploring the sources of supply
- Issuing of tenders and obtaining quotations
- Opening of tenders and quotations and preparation of comparative statements.
- Negotiating over the purchase price and terms of supply

Purchasing process:-

- Placing purchase order
- Receiving of material along with the invoice
- Checking inward invoice
- Inspecting and testing materials
- Forwarding the material to stores
- Checking invoice and passing of bills for payment

Stores Management:-

- Facilitates the maintenance of accounts for each item of inventory.
- Position of inventory can be updated from time to time.

Stores Records:-

- Common used store records:-

1. Material requisition note
2. Purchase order
3. Invoice
4. Goods received note
5. Goods returned note
6. Stores ledger account
7. Bin card

Marketing:-

Definition:- Marketing is an essential function of a modern organization whether it deals in products or services.

According to Philip Kotler:- Marketing as a societal process by which individuals and groups obtain what they need and want through creating, offering, and freely exchanging products and services of value with others.

Functions of marketing:-

- The marketing functions comprise: buying, selling, transportation, storage, standardization, grading, financing, risk taking and market research.
- Based on different authors classification marketing functions:-

1. Functions of exchange
- Buying and assembling
- Selling

Functions of marketing:-

2.Functions of physical supply

- Transportation
- Storage and warehousing

3.Facilitating functions

- Financing
- Risk taking
- Standardization and grading
- Market information and research

Marketing Mix:-

- Marketing is the mixture of four p's

1. Product
2. Promotion
3. Place
4. price

Marketing strategies based on product life cycle:-

- A product is a physical good or service or combination of both.
- It is capable of satisfying the buyer's needs.

Stages in Product Life Cycle:-

- Introduction
- Early growth
- Rapid growth
- Maturity
- Saturation
- Decline

Channels of distribution:-

- Channels of distribution refer to the wages and means of reaching the customer through the intermediaries such as wholesalers, retailers and other agencies.

- Types of Channels of distribution:

1. Manufacturer ------ consumer
2. Manufacturer ---wholesaler---- consumer
3. Manufacturer--- retailer---- consumer
4. Manufacturer---wholesaler--- retailer--- consumer

The HRM Functions:

- The unit taking care of the people in the organization.
- provides significant support and advice to line management.
- examines the various HR processes that are concerned with attracting, managing, motivating and developing employees for the benefit of the organization.

Major Functions of the HRM

- Staffing
- Training and Development
- Motivation
- Maintenance

1. **Staffing**

- aims to locate competent employees and bring them into the organization.
- a continuous activity in the organization.

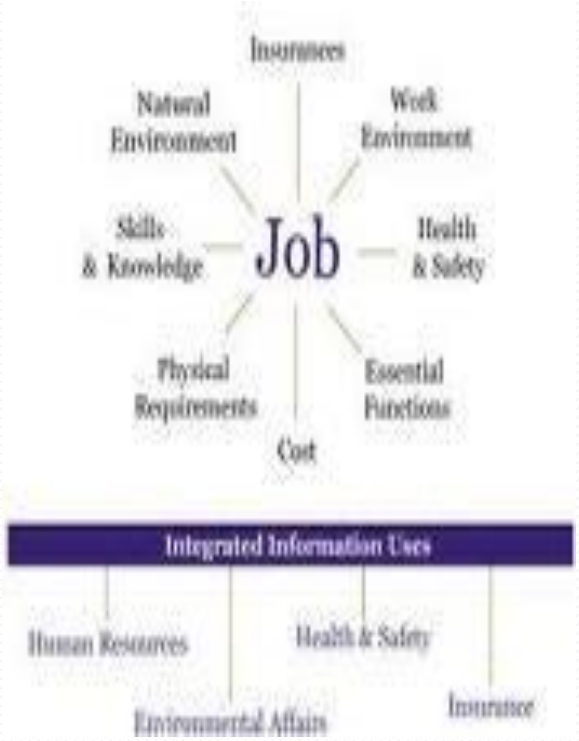
Phases of Staffing:

1. **Employment Planning**

   - Job Design

- According to Michael Armstrong, "Job Design is the process of deciding on the contents of a job in terms of its duties and responsibilities, on the methods to be used in carrying out the job, in terms of techniques, systems and procedures, and on the relationships that should exist between the job holder and his superior subordinates and colleagues." (http://hubpages.com/hub/Job-Design)

2. Job Analysis



- the process whereby jobs are investigated in sufficient detail to enable (a) recruitment of people into them or (b) assessment of the performance of people who are already working in them.

- **Job analysis identifies the following information:**
  - Detailed breakdown of the duties involved in a position
  - Skills, knowledge, attitudes and experiece a person should bring to the position
  - Environment condition of the job

Job Analysis is of two forms:

1. Job Description

- critical skills required for the job
- tasks or performance standard,
- responsibilities and disciplinary procedures
- service condition of the job
- pay rates

Job Specifications

- Describes the requirements of the person for the job
  - abilities
  - educational qualifications
  - special physical and mental skills
  - training
  - experience and others

- -Job descriptions are useful for recruiting and screening new possible employees because of their clarity and comprehensiveness. JD provides a foundation for evaluating job applicants and developing legally justifiable interview questions and screening practices.

3. Recruitment

-initial attraction & screening of applicants.

Internal Sources

- Job Posting
- Intranet
- Succession Plans
- Referrals

External Sources

- Ads
- Job Placement Agencies
- Internet
- Placement thourgh Colleges and Universities

4. Selection

- Application Evaluation

Methods of Selection:

- Interviews
- Tests
- Background Investigations
- Medical Tests

5. Hiring

- This is the process of appointing the person selected for a particular job.

6. Induction

- Introducing the employee to the organization and the organization's culture.
- Introducing the employee to his/her job

2. Training & Development

- **Employee training**
  - Designed to assist employees in acquiring better skills for their current jobs.
- **Employee development**
  - designed to help organization to ensure that it has the necessary talent internally for meeting the future human resource needed.

- **Organization development**
  - **Deals with facilitating system –wide change in the organization.**

- **Career development**
  - **Designed to assist employees in advancing their work lives. However, it is a responsibility of the individual , not of the organization (employee centered)**

3. Motivation

- an employee's intrinsic enthusiasm about and drive to accomplish work
  - 1. Respect between Management and workers
  - 2. Set Performance standard for each employee

4. Maintenance

-retention of productive employees

- **1. Welfare Administration**
  - Medical facilities
  - Canteen facilities
  - Housing facilities
  - Transport facilities
  - Recreation facilities
  - Loan facilities
  - Educational facilities
  - Various Incentive schemes / clear view of retirement benefit

- **2. Health and Safety Administration**
  - employee assistance programs (EAPs)
    - Medical
    - Dental
    - Accidental
    - Educational
    - retirement

3. Communication Program

- E- mail
- voicemail
- intranet
- bulletin board
- function hall
- video conferencing
- telephone/cellphone, etc.

External Elements Affecting HRM

- **1. Dynamic Environment of HRM**
  - Globalization
  - new technology
  - workforce diversity that requires changing skill requirements
  - continuous improvement
  - decentralization
  - employee involvement and ethics.

2. Government legislations

- laws and regulations that benefit the workers and protects them in the workplace.
  - leave benefit (sick, vacation, maternity and
  - other)
  - civil rights act
  - Wages act
  - Person with disability act
  - Gender act.. etc
  - Labor union

- **3. Labor Unions**

  - Labor union exist to assist workers in dealing with the management
  - with a third party representative,
  - to secure wages
  - hours
  - benefits
  - and other terms of condition of employment

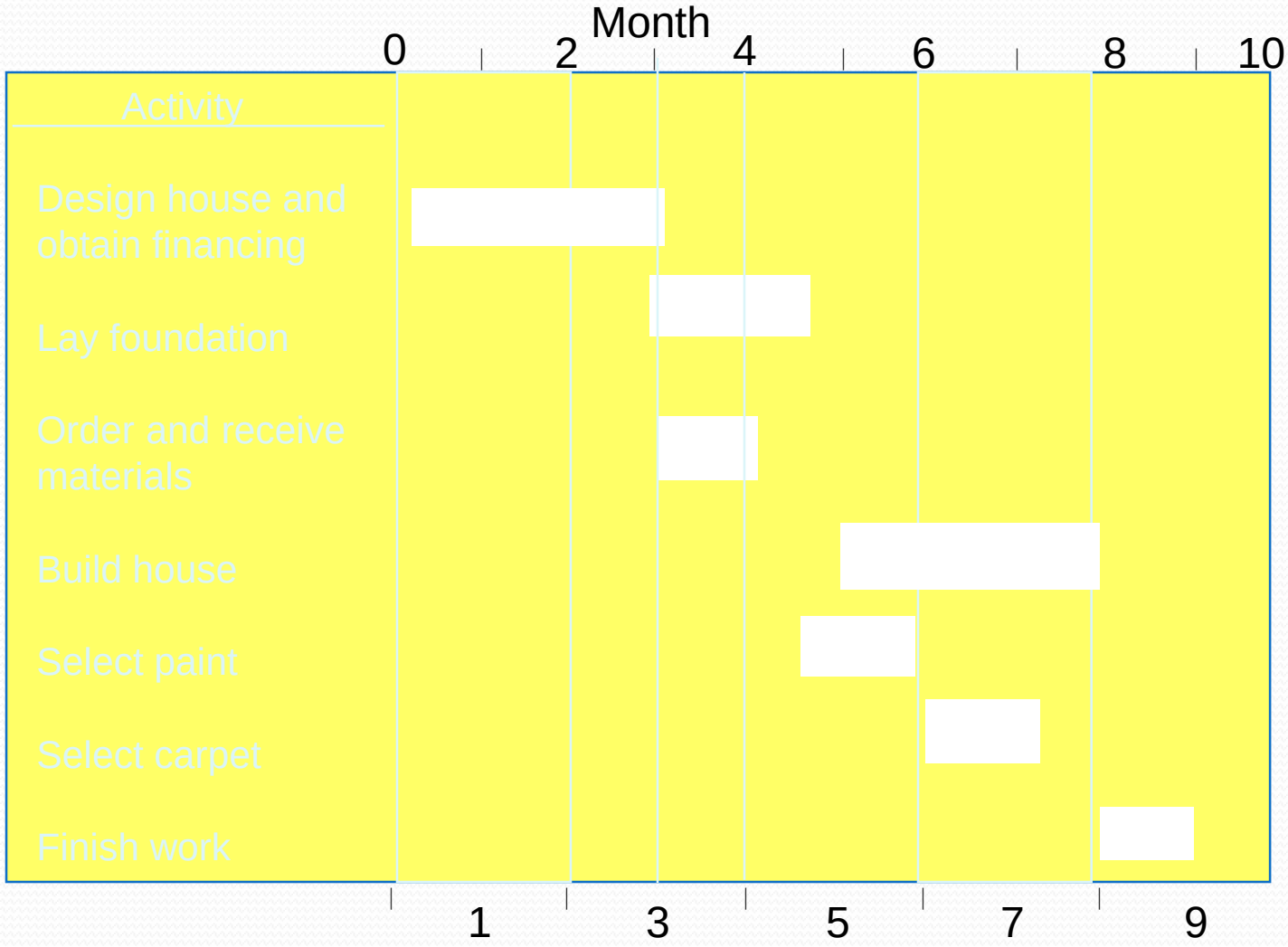
4. Management Thought

- **Frederick Taylor**
  - scientific management
  - Specialization of labor
  - reward
- **Henry Fayol**
  - divided the organization into six- technical, commercial, financial, security, accounting and managerial
  - 14 principles of management
- **Max weber**
  - Bureaucratic organization

Gantt Chart

- Popular tool for project scheduling
- Graph with bar representing time for each task
- Provides visual display of project schedule
- Also shows slack for activities
  - (amount of time activity can be delayed without delaying project)

A Gantt Chart



CPM/PERT

- **Critical Path Method (CPM)**
  - - DuPont & Remington-Rand (1956)
  - - deterministic task times
  - - activity-on-node network construction (AON)

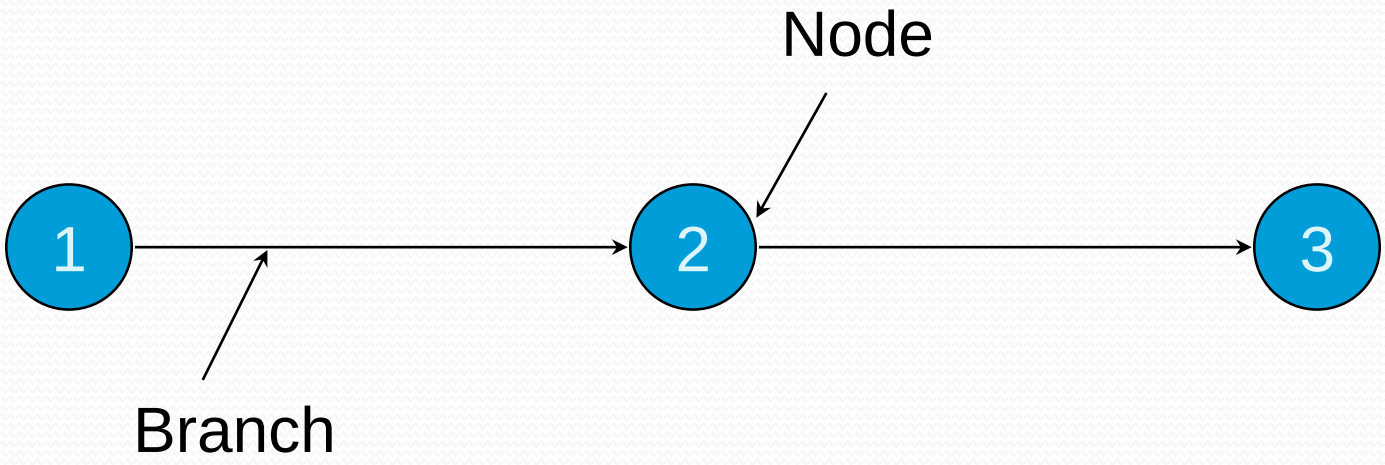
- **Project Evaluation & Review Technique (PERT)**
  - - U.S. Navy, Booz, Allen & Hamilton
  - - multiple task time estimates(probabilistic)
  - - activity-on-arrow network construction (AOA)

Network Construction

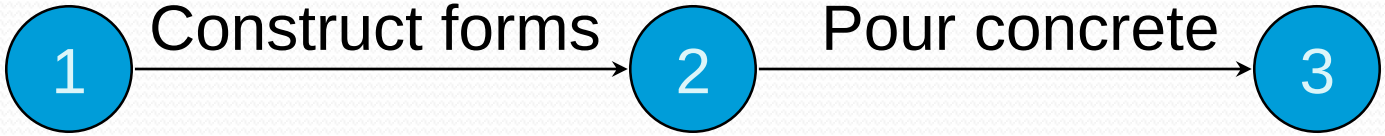
- In AON, nodes represent activities & arrows show precedence relationships
- In AOA, arrows represent activities & nodes are events for points in time
- An event is the completion or beginning of an activity
- A dummy shows precedence for two activities with same start & end nodes

The Project Network

Network consists of branches & nodes



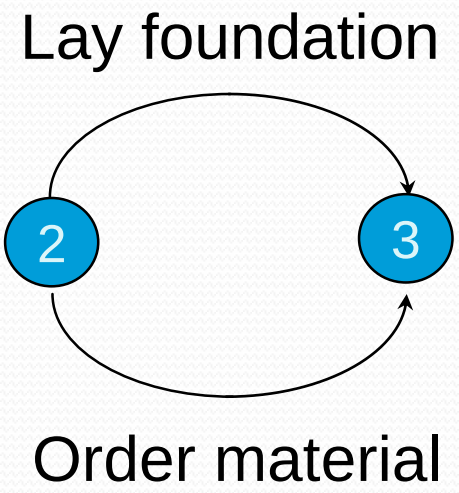
Simplified Project Network



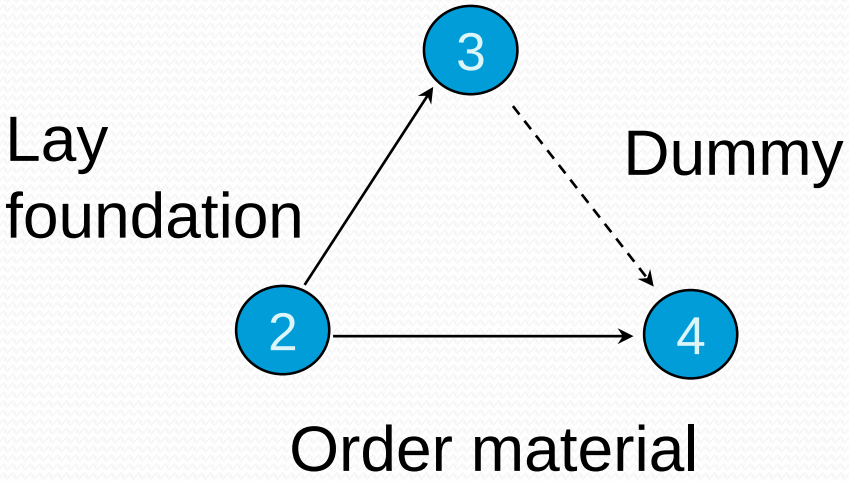
Consider the following table which describes the activities to be done to build a house and its sequence

Activity		predecessors	Duration
A	Design house and obtain financing	-	3
B	Lay foundation	A	2
C	Order and receive materials	A	1
D	Build house	B,C	3
E	Select paint	B,C	1
F	Select carpet	E	1
G	Finish work	D,F	1

Concurrent Activities

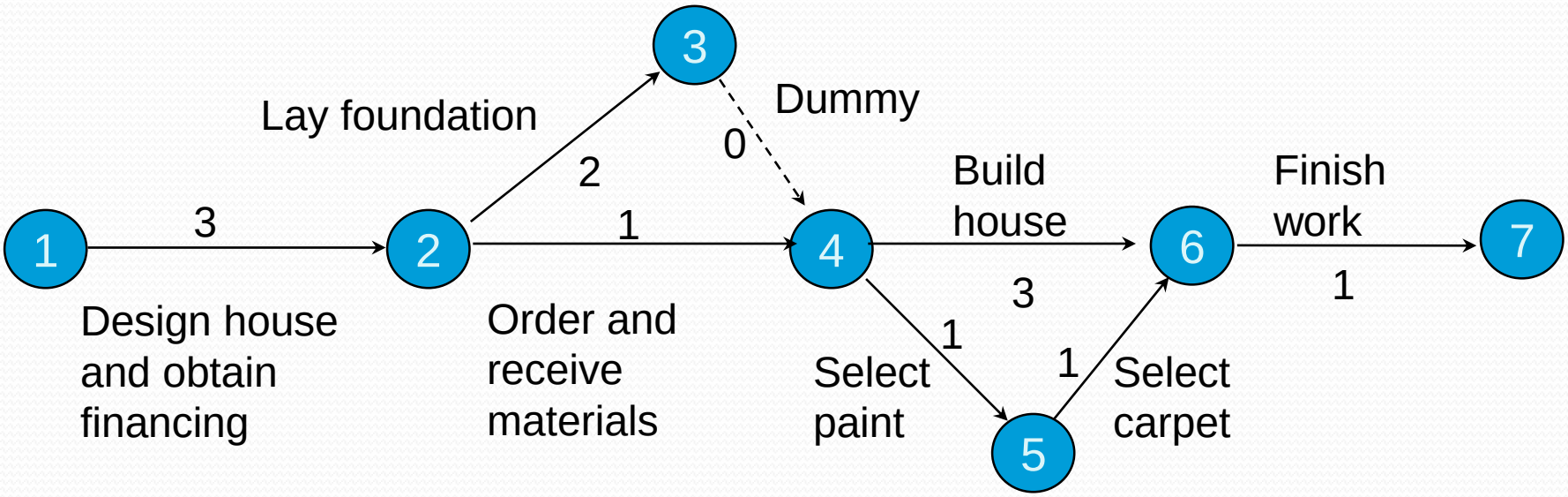


Incorrect precedence relationship



Correct precedence relationship

Project Network For A House



Critical Path

- A path is a sequence of connected activities running from the start to the end node in a network
- The critical path is the path with the longest duration in the network
- A project cannot be completed in less than the time of the critical path (under normal circumstances)

All Possible Paths

path1: 1-2-3-4-6-7

3 + 2 + 0 + 3 + 1 = 9 months; the critical path

path2: 1-2-3-4-5-6-7

3 + 2 + 0 + 1 + 1 + 1 = 8 months

path3: 1-2-4-6-7

3 + 1 + 3 + 1 = 8 months

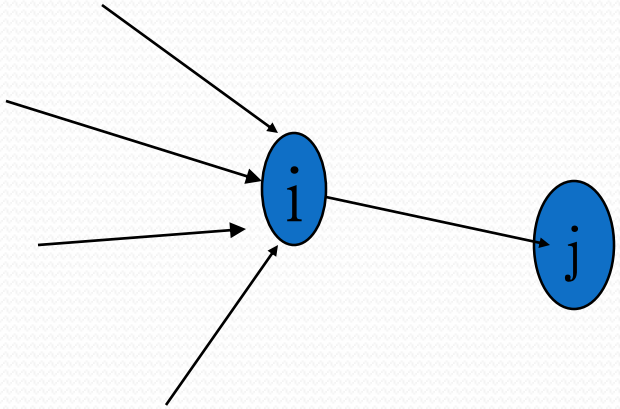
path4: 1-2-4-5-6-7

3 + 1 + 1 + 1 + 1 = 7 months

Early Times

(House building example)

- ES - earliest time activity can start
- Forward pass starts at beginning of network to determine ES times
- EF = ES + activity time
  - ES_{ij} = maximum (EF_i)
  - $EF_{ij} = ES_{ij} + t_{ij}$
  - $ES_{12} = 0$
  - $EF_{12} = ES_{12} + t_{12} = 0 + 3 = 3$ months



Computing Early Times

- ES_{23} = max (EF_2) = 3 months

- ES_{46} = max (EF_4) = max (5,4) = 5 months

- $EF_{46} = ES_{46} + t_{46} = 5 + 3 = 8$ months

- EF_{67} =9 months, the project duration

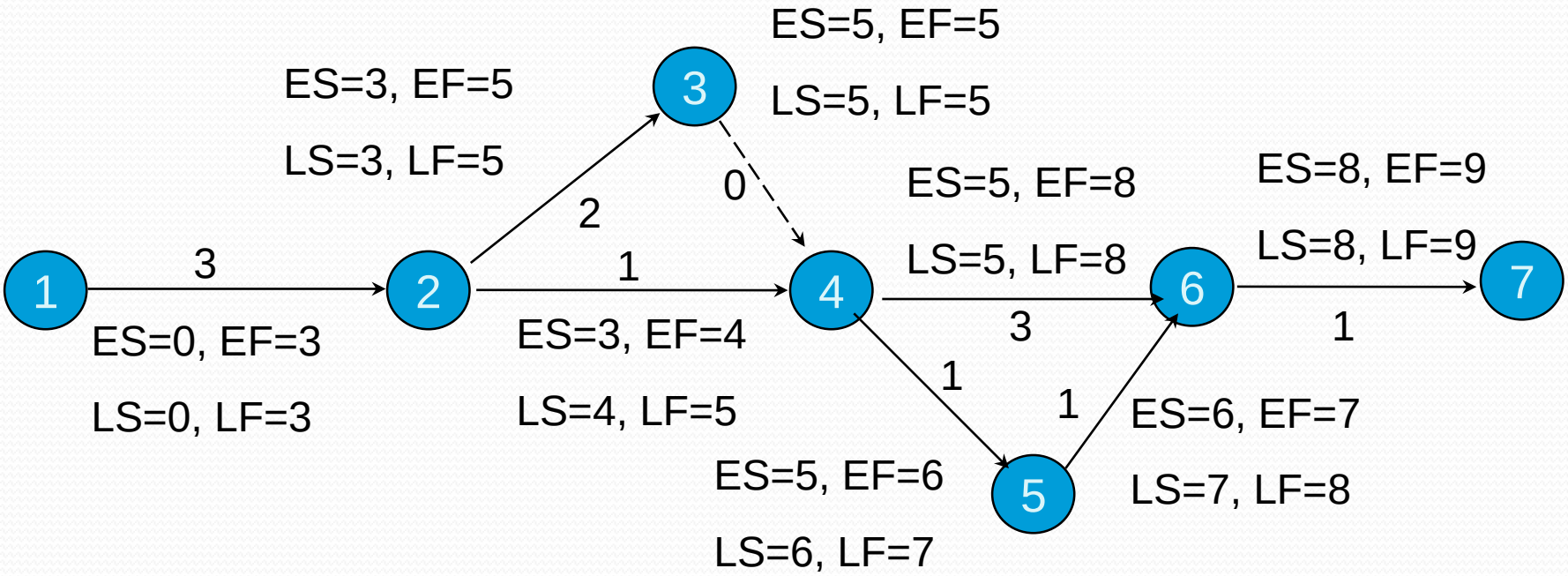
Late Times

- LS - latest time activity can be started without delaying the project
- Backward pass starts at end of network to determine LS times
- LF - latest time activity can be completed without delaying the project
  - $LS_{ij} = LF_{ij} - t_{ij}$
  - $LF_{ij} = \text{minimum } (LS_j)$

Computing Late Times

- If a deadline is not given take LF of the project to be EF of the last activity
- $LF_{67} = 9$ months
- $LS_{67} = LF_{67} - t_{67} = 9 - 1 = 8$ months
- $LF_{56} = \text{minimum}(LS_6) = 8$ months
- $LS_{56} = LF_{56} - t_{56} = 8 - 1 = 7$ months
- $LF_{24} = \text{minimum}(LS_4) = \min(5, 6) = 5$ months
- $LS_{24} = LF_{24} - t_{24} = 5 - 1 = 4$ months

Project cost analysis:-



Activity Slack

- Slack is defined as the LS-ES or LF-EF
- Activities on critical path have ES = LS & EF = LF (slack is 0)

- Activities not on critical path have slack
  - $S_{ij} = LS_{ij} - ES_{ij}$
  - $S_{ij} = LF_{ij} - EF_{ij}$

- $S_{24} = LS_{24} - ES_{24} = 4 - 3 = 1$ month

Total slack/float or Slack of an activity

- **Total slack/ float means the amount of time that an activity can be delayed without affecting the entire project completion time.**
- **The activity on a given path share the maximum possible slack of the activity along that path according to its share.**
- **Sum of the possible slacks of the activities can not exceed the maximum slack along that path.**

Free slack of an activity

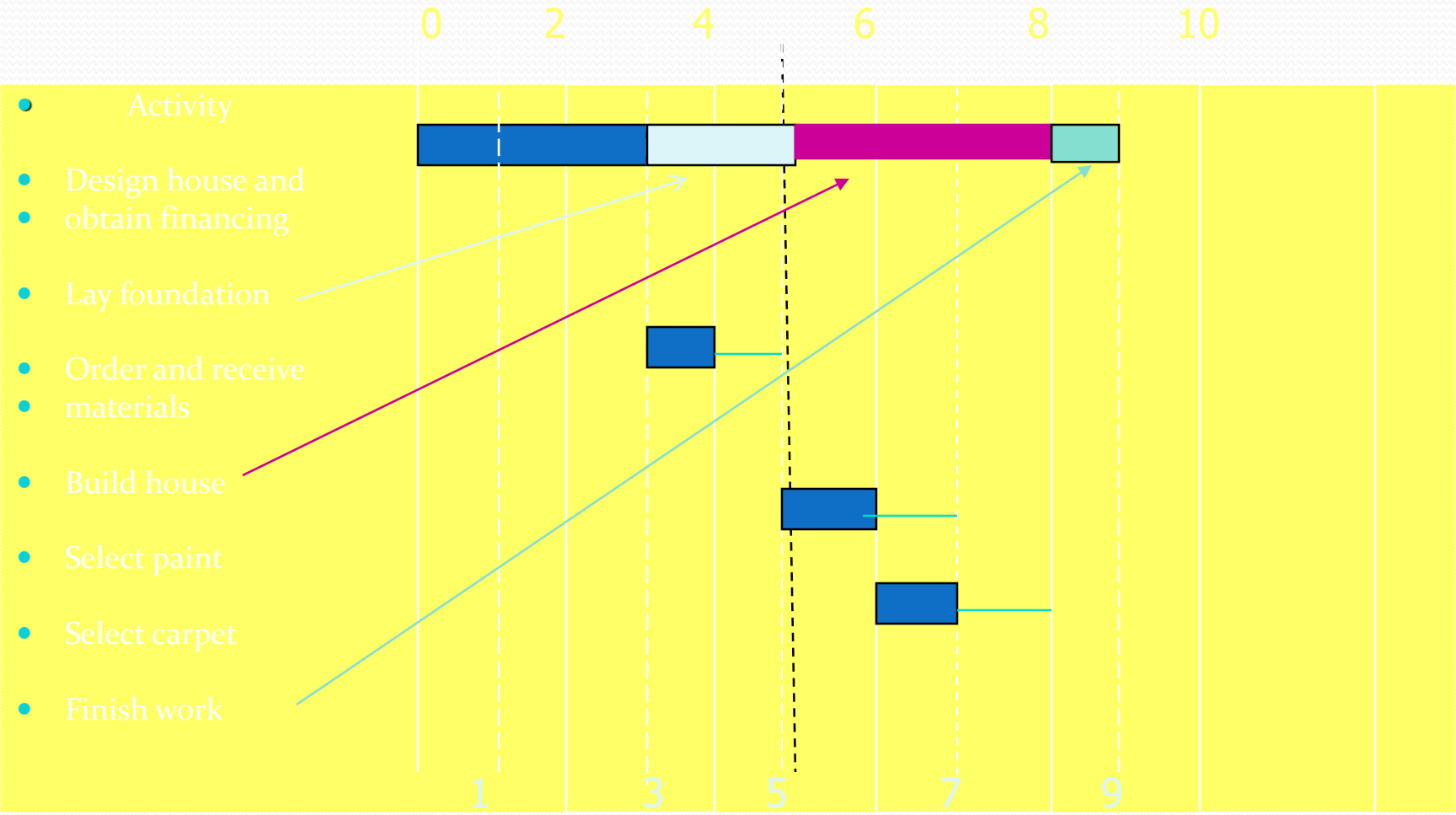
- This is the maximum possible delay of an activity which does not affect its immediate successors.
- This is evaluated as
- $FS_{ij} = ES_j - EF_{ij}$

Activity Slack Data

Activity	ES	LS	EF	LF	Slack (S)	Free slack
1-2*0	0	3	3	0	0	
2-3	3	3	5	5	0	0
2-4	3	4	4	5	1	1
3-4*5	5	5	5	0	0	
4-5	5	6	6	7	1	0
4-6*5	5	8	8	0	0	
5-6	6	7	7	8	1	1
6-7*8	8	9	9	0	0	

* Critical path

Probability of completing the project within given time:-



Probabilistic Time Estimates

- **Reflect uncertainty of activity times**
- **Beta distribution is used in PERT**

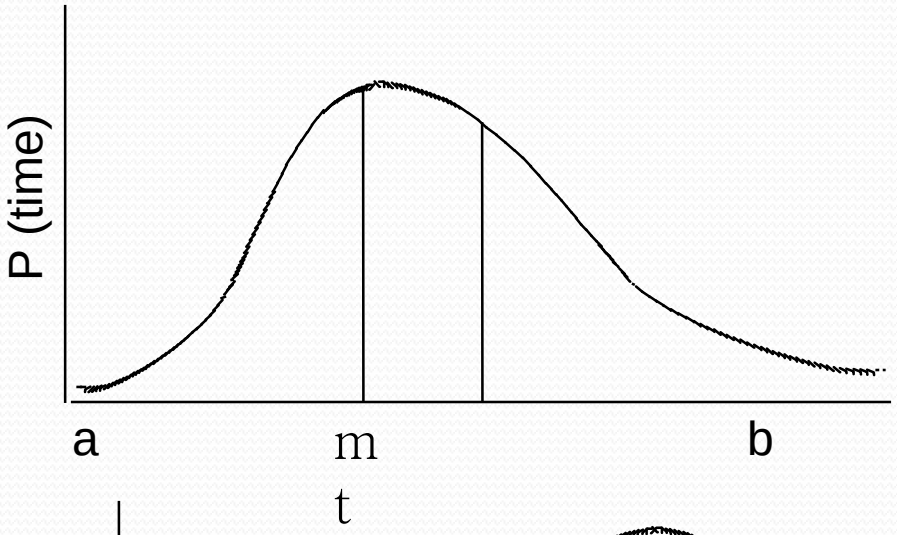
Mean (expected time): $t = \frac{a + 4m + b}{6}$

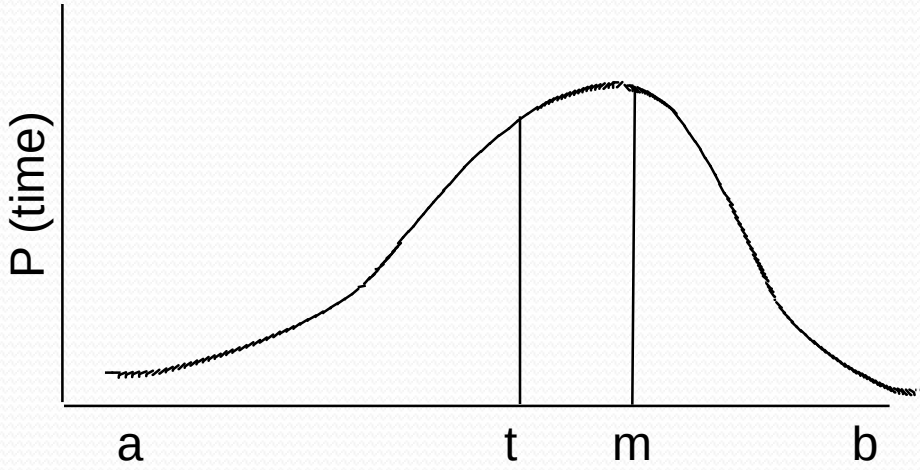
Variance: $\sigma^2 = \left(\frac{b - a}{6}\right)^2$

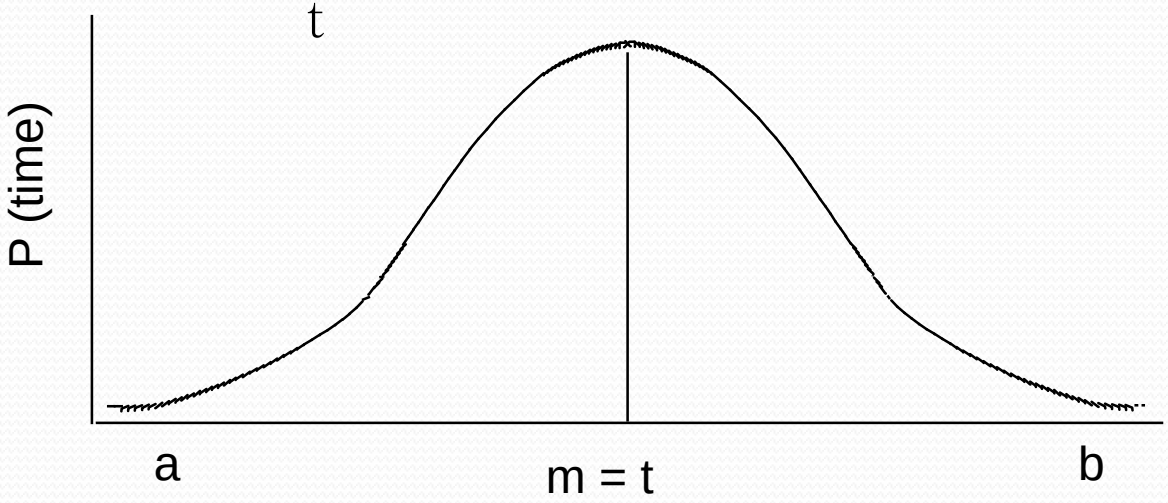
where,

a = optimistic estimate
m = most likely time estimate
b = pessimistic time estimate

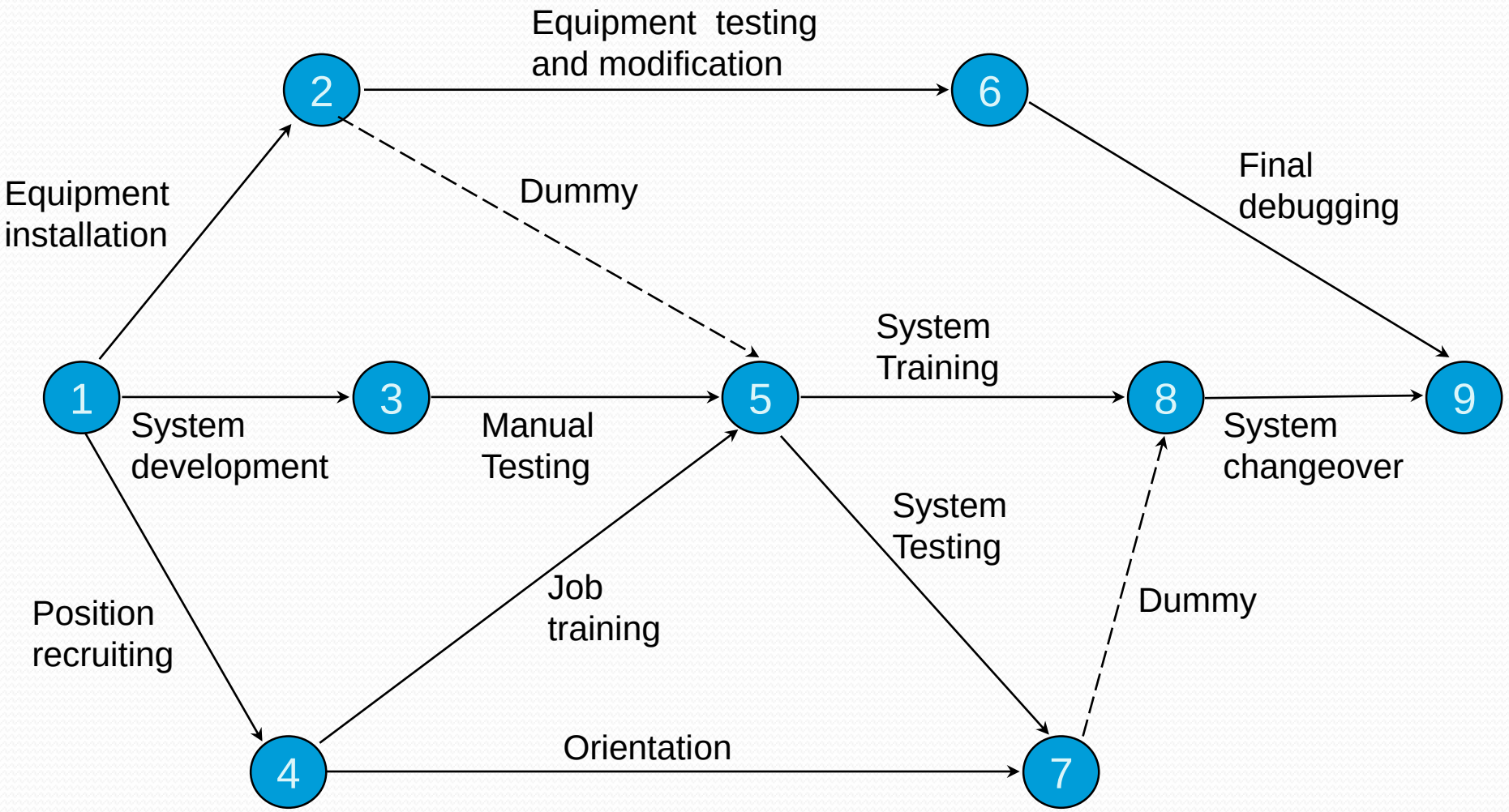
Example Beta Distributions







PERT Example



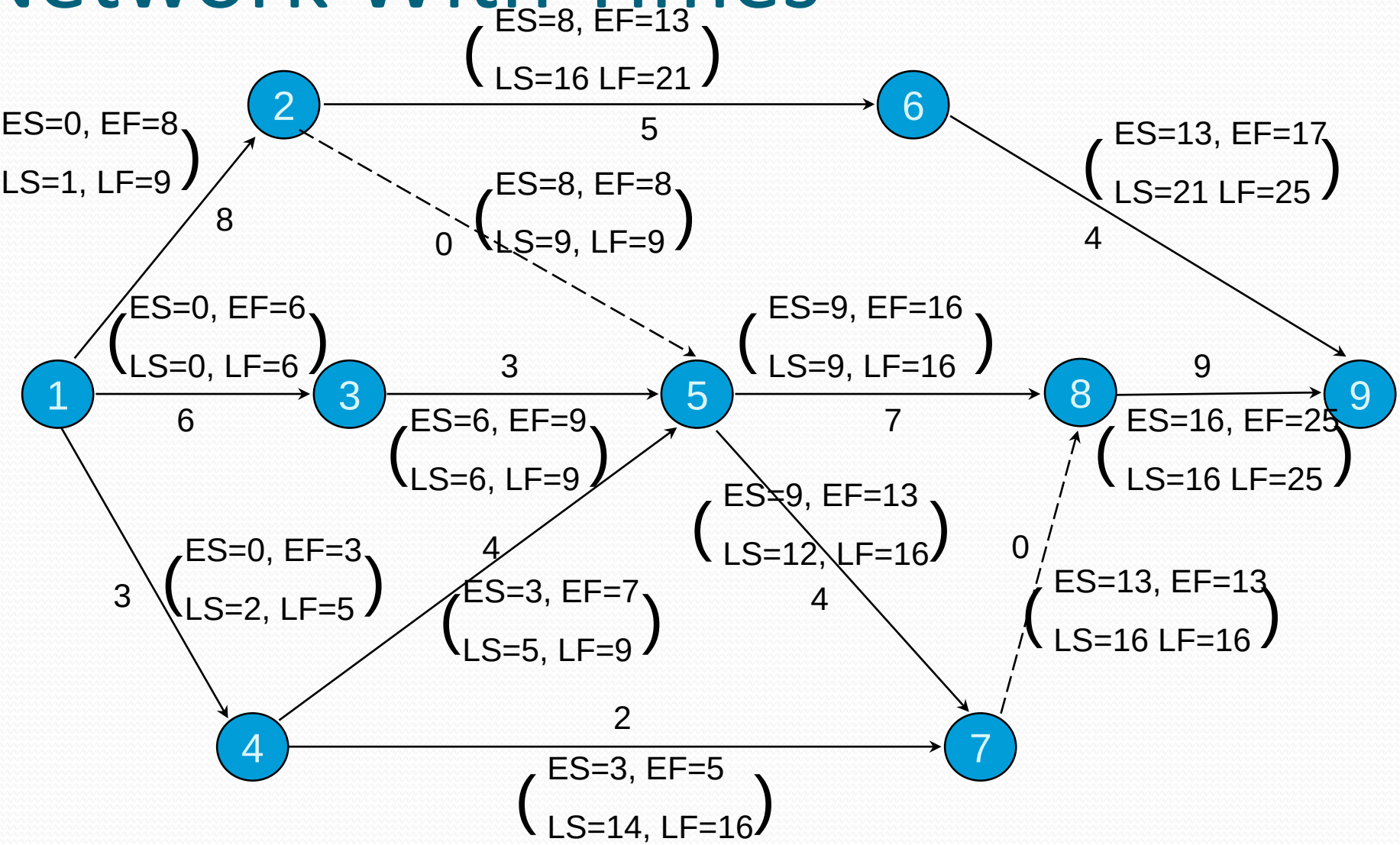
Activity Information

	Time estimates (wks)			Mean Time	Variance
Activity	a	m	b	t	σ^2
1 - 2	6	8	10	8	.44
1 - 3	3	6	9	6	1.00
1 - 4	1	3	5	3	.44
2 - 5	0	0	0	0	.00
2 - 6	2	4	12	5	2.78
3 - 5	2	3	4	3	.11
4 - 5	3	4	5	4	.11
4 - 7	2	2	2	2	.00
5 - 8	3	7	11	7	1.78
5 - 7	2	4	6	4	.44
7 - 8	0	0	0	0	.00
6 - 9	1	4	7	4	1.00
8 - 9	1	10	13	9	4.00

Early And Late Times

Activity	t	σ^2	ES	EF	LS	LF	S	FS?
1 - 2	8	0.44	0	8	1	9		1
1 - 3	6	1.00	0	6	0	6		0
1 - 4	3	0.44	0	3	2	5		2
2 - 5	0	0.00	8	8	9	9		1
2 - 6	5	2.78	8	13	16	21		8
3 - 5	3	0.11	6	9	6	9		0
4 - 5	4	0.11	3	7	5	9		2
4 - 7	2	0.00	3	5	14	16		11
5 - 8	7	1.78	9	16	9	16		0
5 - 7	4	0.44	9	13	12	16		3
7 - 8	0	0.00	13	13	16	16		3
6 - 9	4	1.00	13	17	21	25		8
8 - 9	9	4.00	16	25	16	25		0

Network With Times



Project Variance

Project variance is the sum of the variances along the critical path

$$\sigma^2 = \sigma^2_{13} + \sigma^2_{35} + \sigma^2_{58} + \sigma^2_{89}$$

$$= 1.00 + 0.11 + 1.78 + 4.00$$

$$= 6.89 \text{ weeks}$$

Probabilistic Network Analysis

Determine the probability that a project is completed (project completion time is) within a specified period of time

where $$Z = \frac{x - \mu}{\sigma}$$

$\mu = t_p$ = project mean time

σ = project standard deviation

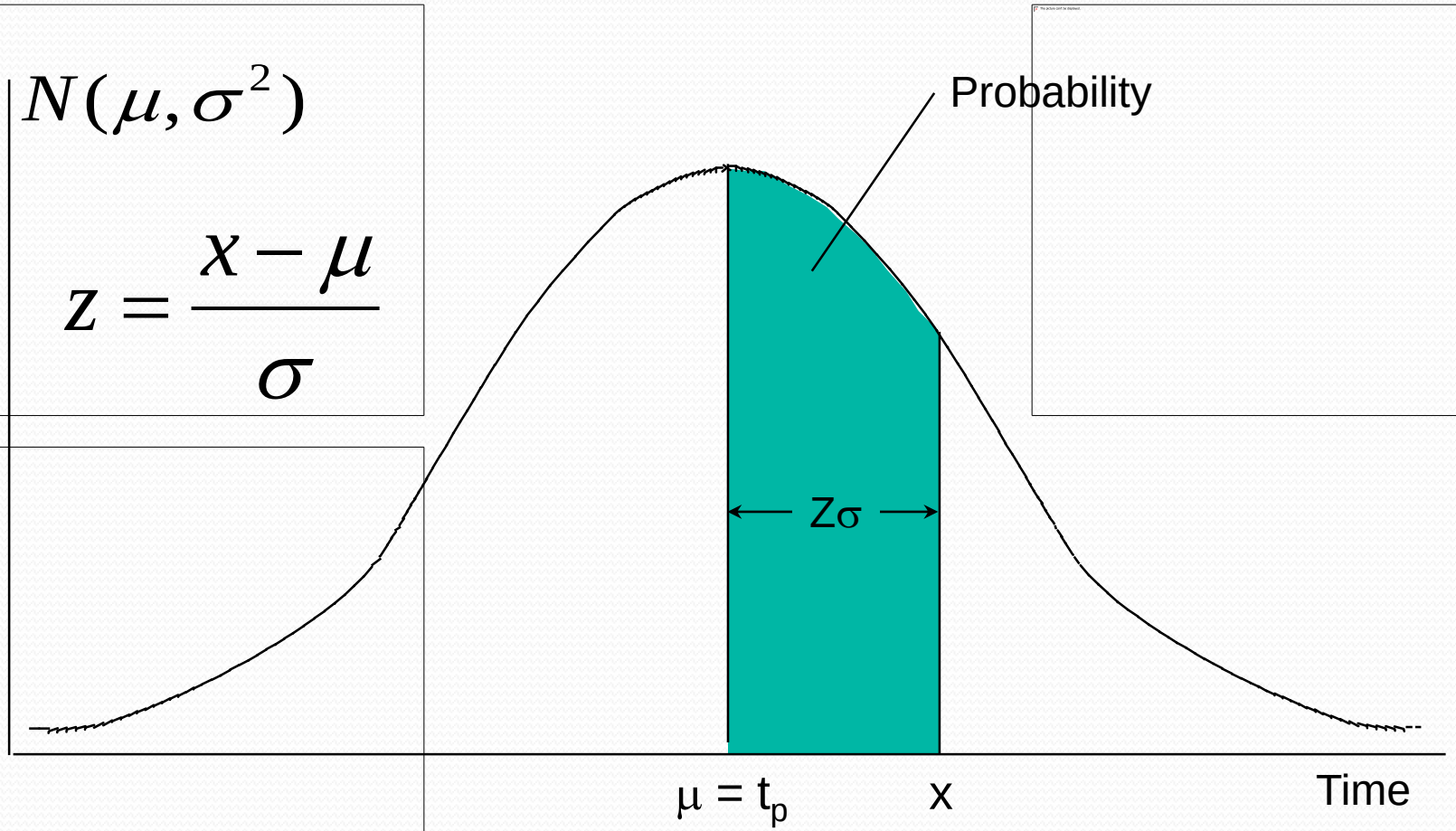
x = project time (random variable)

Z = number of standard deviations of x from the mean (standardized random variable) →

Normal Distribution Of Project Time

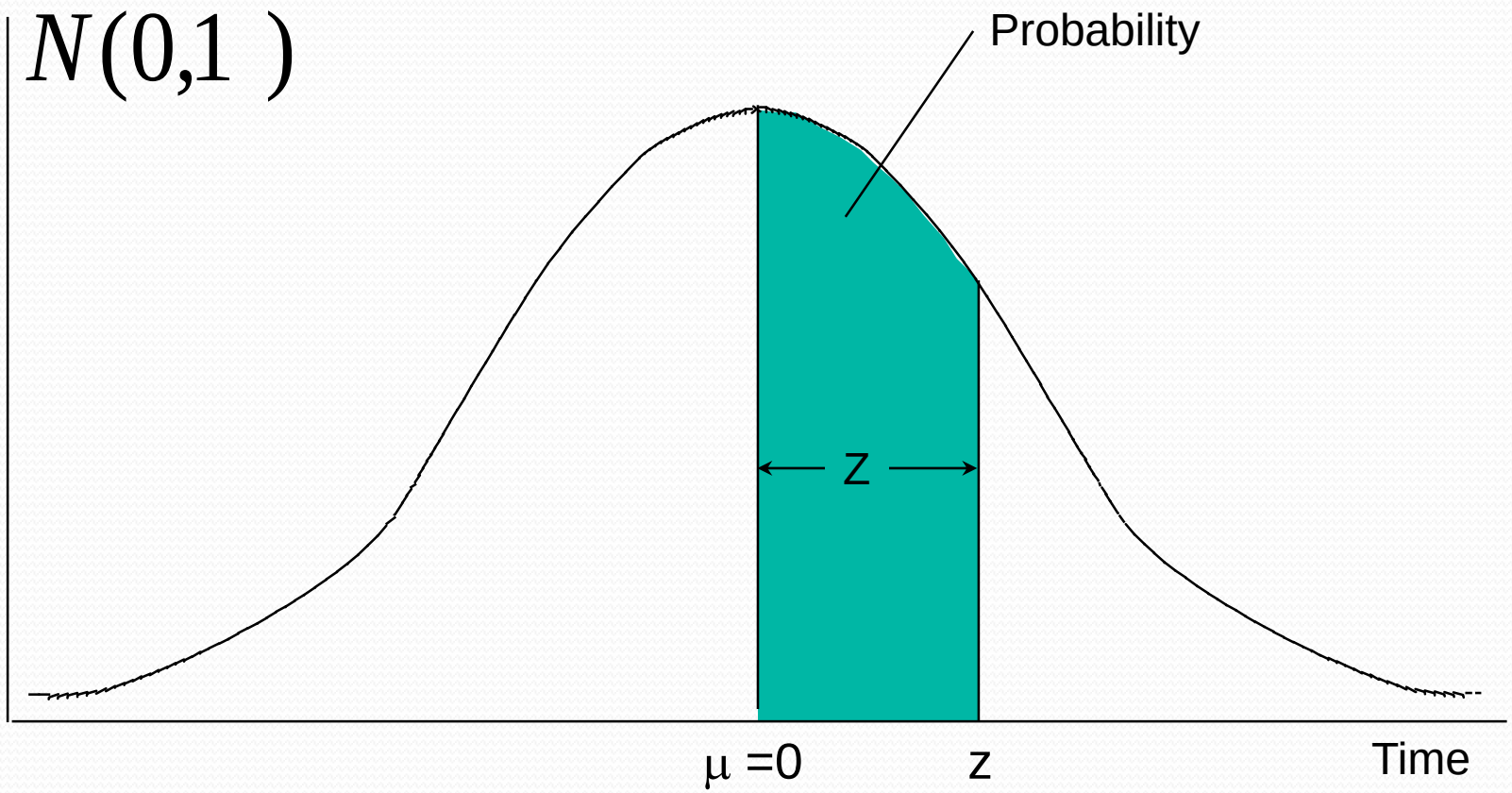
$$X \sim N(\mu, \sigma^2)$$

$$z = \frac{x - \mu}{\sigma}$$



Standard Normal Distribution Of transformed Project Time

$Z \sim N(0,1)$



Probabilistic Analysis Example

What is the probability that the project is completed within 30 weeks?

6.89 weeks

$P(X \leq 30) = ?$

$\sigma^2 =$

$\sigma = \sqrt{6.89} = 2.62$ weeks

$Z = x - \mu = 30 - 25 = 1.91$

$P(Z \leq 1.91) = ?$

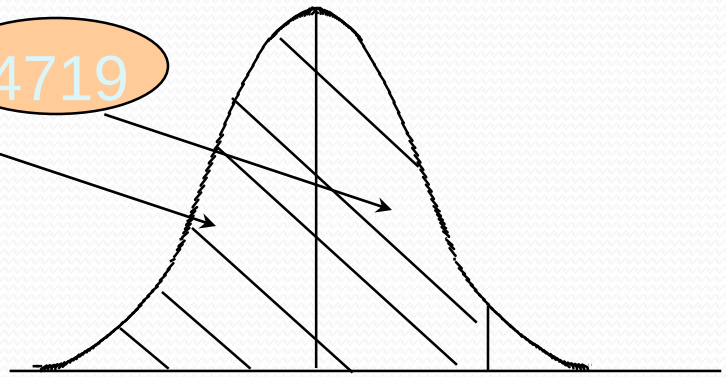
σ 2.62

Determining Probability From Z Value

Z	0.00	0.01 ..	04	…	0.09
1.1	0.3643	0.3665	0.3729		
1.9	0.4713	+0.4719	…		0.4767

P(x ≤ 30 weeks) = 0.50+ 04719

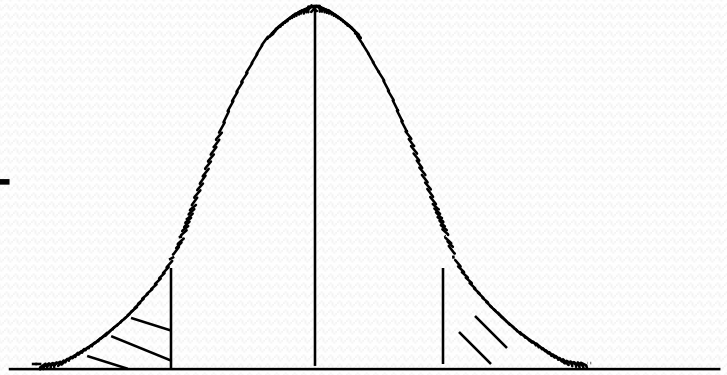
= 0.9719



What is the probability that the project will be completed within 22 weeks?

$$Z = \frac{22 - 25}{2.62} = \frac{-3}{2.62} = -1.14$$

$P(Z \leq -1.14) = 0.1271$



$P(x \leq 22 \text{ weeks}) = 0.1271$

Benefits of PERT/CPM

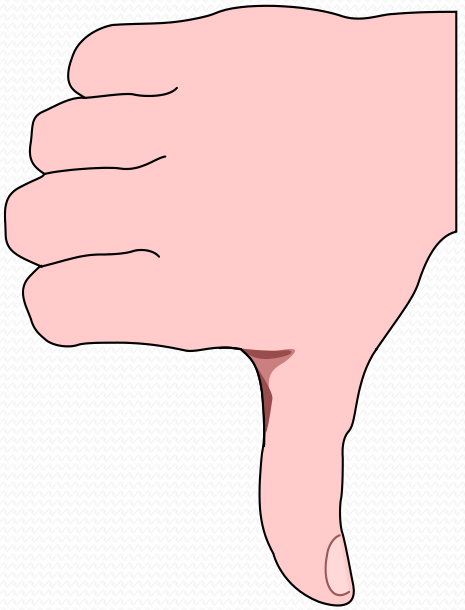
- Useful at many stages of project management
- Mathematically simple
- Uses graphical displays
- Gives critical path & slack time
- Provides project documentation
- Useful in monitoring costs

Advantages of PERT/CPM

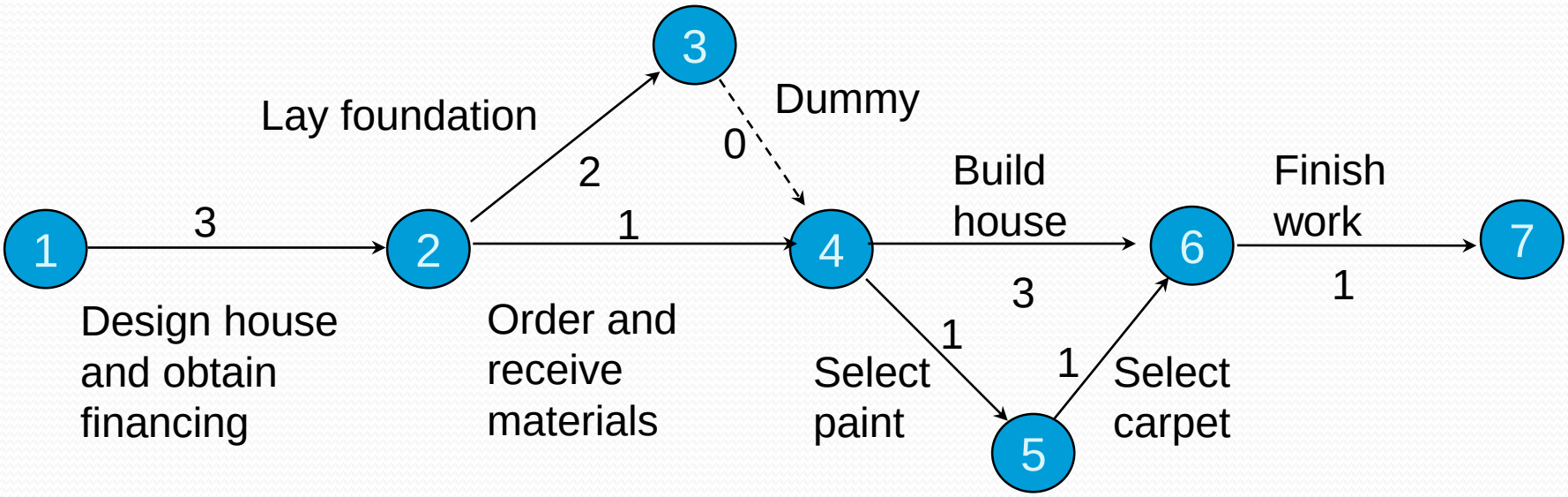
- Networks generated provide valuable project documentation and graphically point out who is responsible for various project activities
- Applicable to a wide variety of projects and industries
- Useful in monitoring not only schedules, but costs as well

Limitations of PERT/CPM

- Assumes clearly defined, independent, & stable activities
- Specified precedence relationships
- Activity times (PERT) follow beta distribution
- Subjective time estimates
- Over-emphasis on critical path



Identifying Critical path:-



Project crashing:-

- When the two methods like work study, trade off and other possible ones fail, we go for crashing.
- Crashing includes:

  Normal cost

  Normal Time

  Crash cost

  Crash Time

  Direct cost

  Indirect cost

  optimization cost

Mission:-

- Also called ‘overall objective’ or ‘overall goal’
- Mission statement defines the basic reason for the ‘existence of organization’ .
- A mission statement defines why the organization exists. It describes the customer needs, both present and future.

Characteristics:-

- It must be clear enough to trigger action.
- It focuses on customer needs and utilities, not products.
- It should be capable of being measured in terms of specific targets.
- It should focus on limited number of goals.
- It is a facilitator.
- It provides for shared vision.
- It should be flexible.
- It also identifies the core principles to guide decision making

Goals:-

- Goals are the overall objectives of a department or an organization.
- Goal is defined as what an organization wants to achieve during or by the end of a given period.

Significance:-

- It helps to define the organization in its environment.
- It helps in coordinating decisions
- Goals are more tangible targets.
- It facilitates performance appraisal

Objective:-

Objectives explain why one should do the given job.

Policy:-

- Policy is a broad guideline set by the top management for the purpose of making decisions at different levels in the organization.

Features of policy:-

- It expresses organizational culture.
- It is a guide to managerial performance.
- It brings out uniformity in action.
- It provides discretion to managers.
- It creates and sustains good conduct and character.

Strategy:-

- It is drawn from the armed forces.
- It is a strategic plan that interlocks all aspects of the corporate mission designed to overpower the enemy or the competitor.

Purpose:-A strategy is an operational

tool to achieve the goals, corporate

mission

Programmes:-

- Refer to the logical sequence of operations to be performed in a given project or job.
- A programme is based on a set of goals, policies, procedures, rules and task assignments.

Corporate planning:-

The top level planning associated with realisation of these goals is called ‘corporate planning’.

Definition:- can be defined as the process of formulating the corporate mission, scanning the business environment, evolving strategies, creating necessary infrastructure and assigning resources to achieve the given mission.

Elements of corporate planning process:-

- Corporate Mission
- Formulate Strategic objectives
- Appraise internal and external environment
- Develop and evaluate alternative strategies
- Select the best strategy
- Fix key targets and allot resources to strategic business units (SBUs)
- Develop operating plans
- Monitor the performance
- Revise, where necessary

Environmental Scanning:-

A major purpose of environmental scanning is to identify and understand the new opportunities in which the company can perform profitability.

- Environmental scanning involves an analysis and diagnosis of the external and internal environments of the business firm.

SWOT Analysis:-

- Is defined as the rational and overall evaluation of a company's strengths, weaknesses, opportunities and threats which are likely to affect the strategic choices significantly.

- Some sources of threats:-

1. political risks
2. Social risks
3. Economic risks
4. Financial risks

Strategy Formulation and Implementation:-

- Stages:

1. Identification of mission and objectives
2. Environmental scanning
3. Generic strategy alternatives
4. Strategy variations
5. Strategic choice
6. Allocation of resources and formulation of organizational structure
7. Formulation of plans, policies, programmes and administration
8. Evaluation and control

Generic Strategy Alternatives:-

- There are four strategic alternatives for any business

1. Expansion strategy
2. Stability strategy
3. Retrenchment strategy
4. Combination strategy

Just-In-Time (JIT)

- JIT is an alternative to MRP system for certain type of production and as a bridge between management and work guide lines.
- JIT is applied systematically can have wide range of implications on marketing and transportation besides economizing production.
- JIT is defined as an approach to minimize waste in manufacturing in the fore of time, energy and errors.

Total Quality Management (TQM)

- TQM is a total management system that sets the direction and focus the vision on the company.
- TQM allows to identify and develop an interaction among corporate problems for solutions.
- TQM specify policy management , team efforts, vendor quality, education and training.

Six sigma and Capability Maturity Model (CMM)

- Six sigma is a tool that must be wielded both at the design stage and at the process stage.
- Six sigma is converting defect prove business in to power of performance.
- Objectives of six sigma are: design, operate and control everyone of the processes in such a way that more of them yield more than 3,4defects out of every 1 million units of outputs

Supply Chain Management

- Supply chain is the entire process of accepting a customer order through to delivery of the product to the customer inclusive of supply procurement and production of the product.
- SCM is the overall system of coordinating closely with suppliers so that both the firm and its supplier reap the benefit of smaller inventories, some other production and less waste.

Supply Chain Management

- SCM is the coordination of purchasing, manufacturing, shipping, and billing operations, often supported by an ERP system.
- It can also be said that it is the coordination of all the activities and information flows involved in buying, making and moving a product.

Enterprise Resource Planning (ERP)

- ERP is an integrated cross functional software that re-engineers manufacturing, distribution, finance, human resources and other basic business processes of a company to improve its efficiency, agility and profitability.

Performance Management

- Displays the performance outcomes calculated for quarter's exiters, where all UI wage data has NOT been posted.

Performance Management Example

- Year To Date Managers Report – Displays only the quarters for which all UI wage data has been posted and whose program year September 30th deadline has not passed. Supplemental income can still be added in the Year To Date Managers Report outcomes. Select the LWA, program year and program quarter from the drop down boxes. Select view outcomes.

Business Process Outsourcing (BPO)

- It is the process of purchasing products or services from another firm.
- It is the practice of contracting computer center operations, telecommunication networks, or applications development to external vendors.
- Eg:-All major auto companies outsource manufacturing of many components.

Business process Re-engineering:-

- Dr. Michael Hammer defines BPR as “the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance such as cost , quality, service and speed”.

Bench Marking:-

- Bench marking is a skill, an attitude and practice on excellence. A bridge between staff analysis, design of line programme for continuous improvement.
- Bench marking is the first step to effective TQM. It is comparatively new to Indian companies.
- It is the continuous process of measuring products, services and practices against the competitor.

Balanced Score Card:-

- The Balanced Scorecard Toolkit reviews the history of Balanced Scorecard concept, compares this concept with other management concepts, gives a detailed ideas on how to develop, implement and use Balanced Scorecard to improve business productivity.