Project
And
Project Management

What is a project?

Project-

"A temporary endeavor undertaken to create a unique product, service or result"

How Temporary?

Has a finite duration with a definite beginning and an end

Ceases when objectives have been met

Team disbands on project completion

How Unique?

*Produced as a result of the project is different in some way or the other*

Examples of Project

❑ **Building construction**

❑ **Road construction**

❑ **Shut down project**

❑ **Wedding ceremony**

❑ **Moving office to a new location**

  etc.

Using a Project Selection Metrics

- **Financial return**
- **Effect on employees and alignment with corporate culture**
- **Technical advancement or innovation**
- **Market value/share**
- **Public perception**
- **Alignment with or advancement of corporate planning**

Triple Constraint Theorem
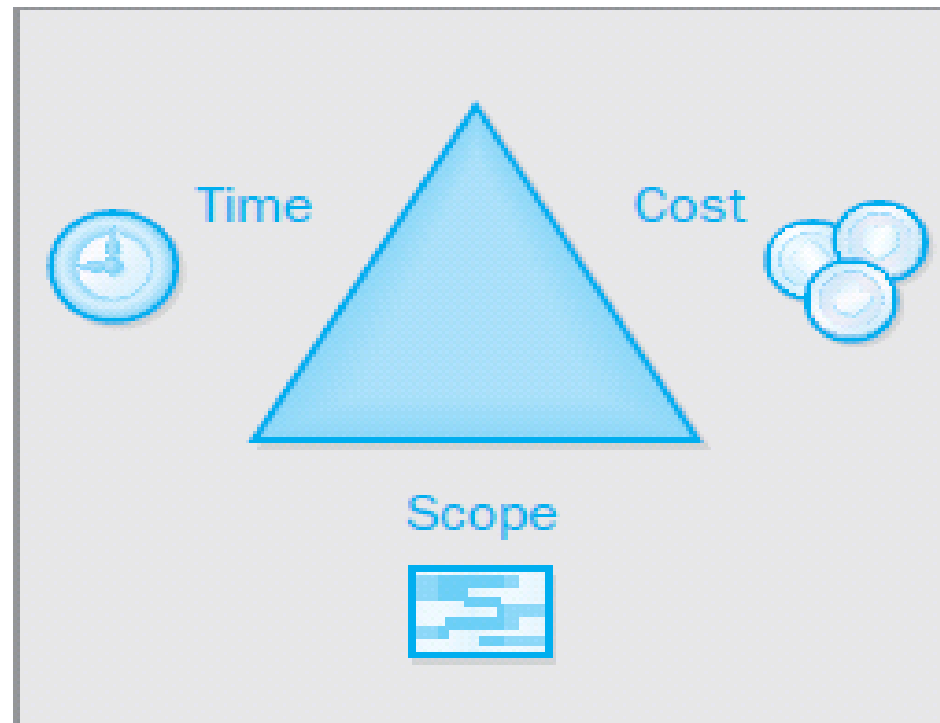
Evaluate the competing demands of Scope, Time, Cost and their impact on Quality ensuring Customer satisfaction
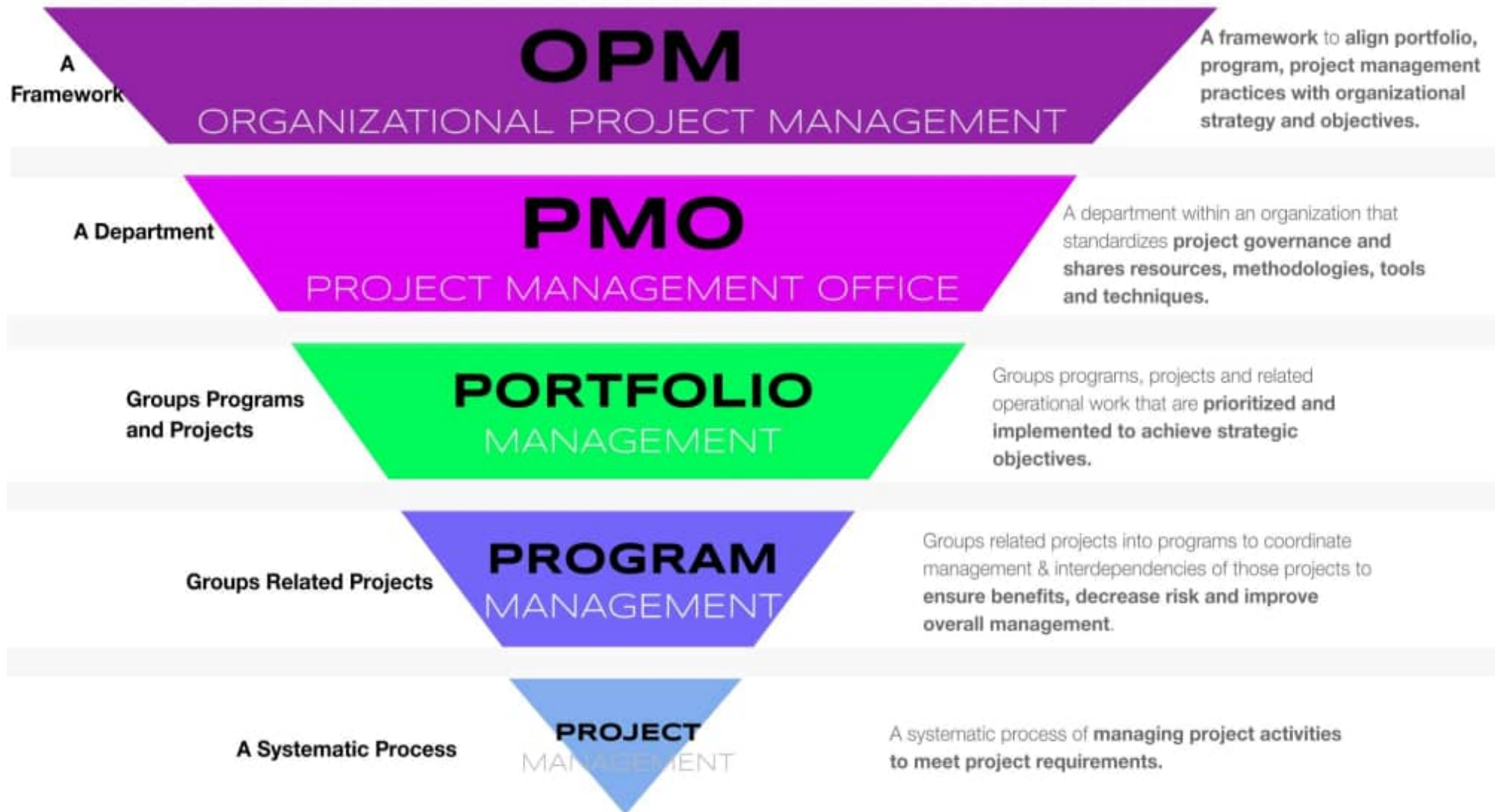
What is Project Management?

Project Management-

"The application of Knowledge, Skills, Tool & Techniques, to project activities in order to meet the Project objectivities"

What is a Project Management?

❖ **Knowledge — Through subjects and experience**

❖ **Skills — Leadership, communication, motivation, negotiation, problem solving, Budgeting etc.**

❖ **Tools and techniques — Equipments, concepts and software. E.g., lathe, excavator, Auto CAD, MS Office Project, Primavera, Jira etc.**

What is a Project Strategy?

👑 STRATEGY

OPM — ORGANIZATIONAL PROJECT MANAGEMENT
A Framework — A framework to align portfolio, program, project management practices with organizational strategy and objectives.

PMO — PROJECT MANAGEMENT OFFICE
A Department — A department within an organization that standardizes project governance and shares resources, methodologies, tools and techniques.

PORTFOLIO MANAGEMENT
Groups Programs and Projects — Groups programs, projects and related operational work that are prioritized and implemented to achieve strategic objectives.

PROGRAM MANAGEMENT
Groups Related Projects — Groups related projects into programs to coordinate management & interdependencies of those projects to ensure benefits, decrease risk and improve overall management.

PROJECT MANAGEMENT
A Systematic Process — A systematic process of managing project activities to meet project requirements.

Training Workshop on Project Management

Activity Definition

Decomposing the work package further into Tasks and Activities

- **Decompose the work only up to the level you would like to track it**

Activity Sequencing

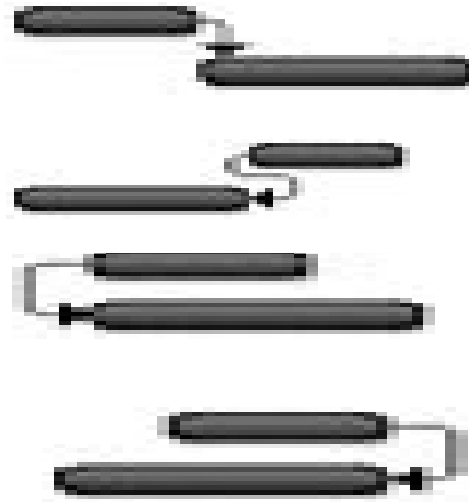**Identifying the task relationships and supplying the right sequence**

Dependency Types:

- **Mandatory – Hard Logic (MFO, MSO)**
- **Discretionary – Soft Logic (ASAP, ALAP, SNET, SNLT, FNET, FNLT)**
- **External**

Task Relationships

There exists four types of Task relationships

- **FS : Finish to Start**
- **SF : Start to Finish**
- **SS : Start to Start**
- **FF : Finish to Finish**

Duration Estimation

PERT- Program Evaluation Review Technique

Three-point analysis:

- **Pessimistic**
- **Optimistic**
- **Most Likely**

**PERT = (P + O + 4M) / 6**

Standard Deviation = (P - O) / 6

Variance = Standard Deviation^2

# Bar Charts and Activity Networks

- **Graphical notations used to illustrate the project schedule.**

- **Shows project breakdown into tasks. Tasks should not be too small. They should take about a week or two.**

- **Activity charts show task dependencies and the critical path.**

- **Bar charts show schedule against calendar time.**
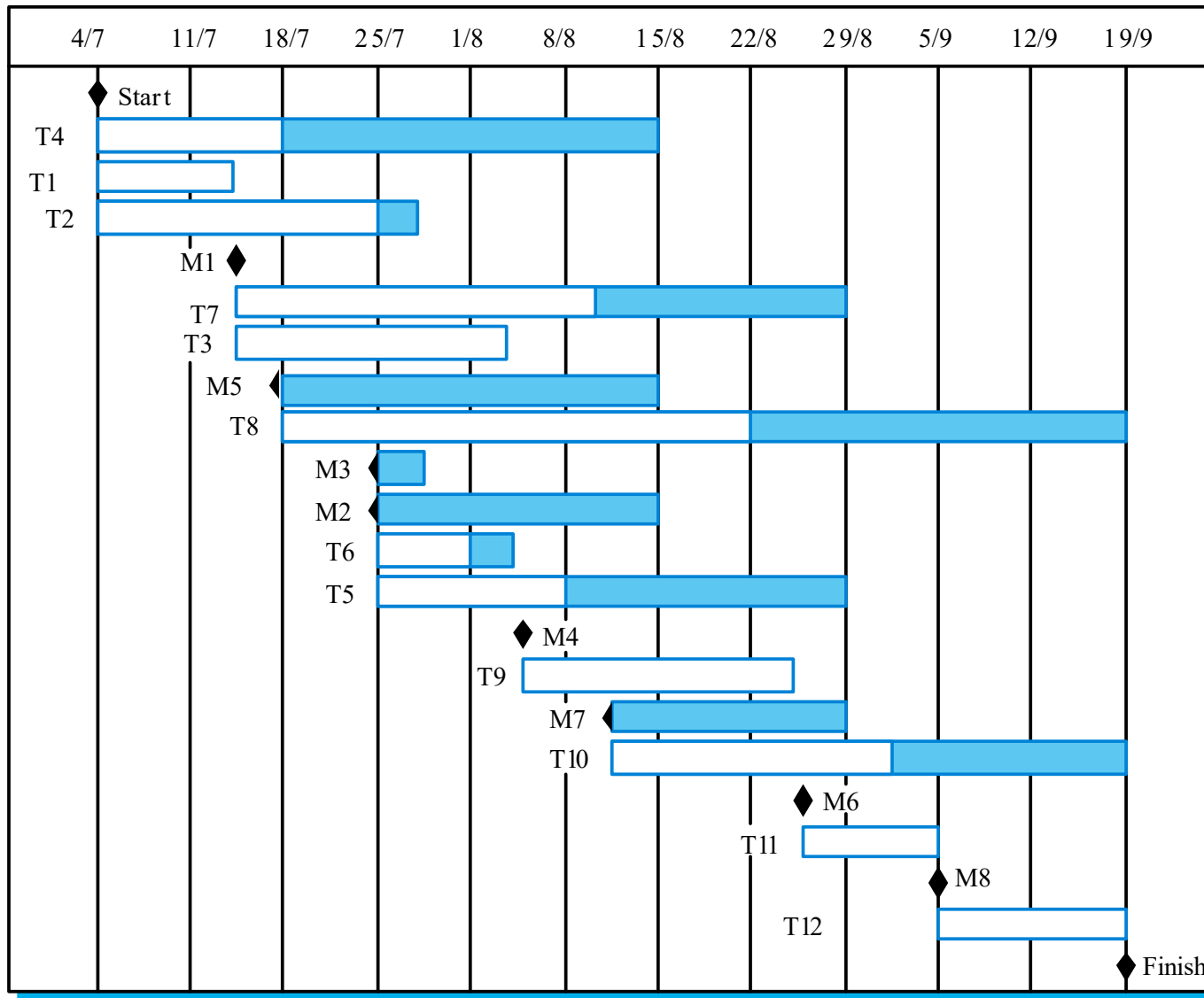
Task Durations and Dependencies

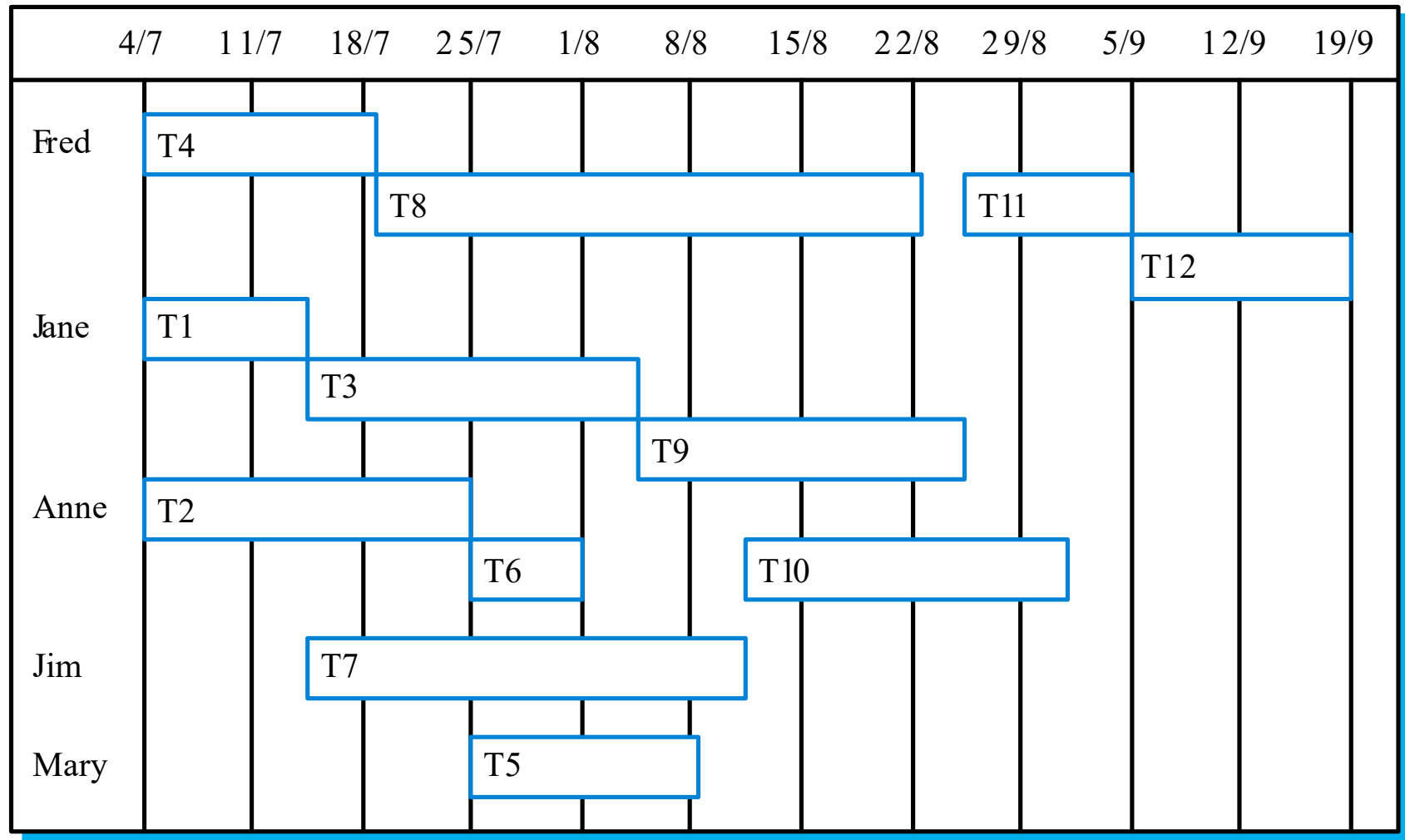| Activity	Duration (days)	Dependencies
T1	8	
T2	15	
T3	15	T1 (M1)
T4	10	
T5	10	T2, T4 (M2)
T6	5	T1, T2 (M3)
T7	20	T1 (M1)
T8	25	T4 (M5)
T9	15	T3, T6 (M4)
T10	15	T5, T7 (M7)
T11	7	T9 (M6)
T12	10	T11 (M8)

Shift-A

15 03

Shift-B
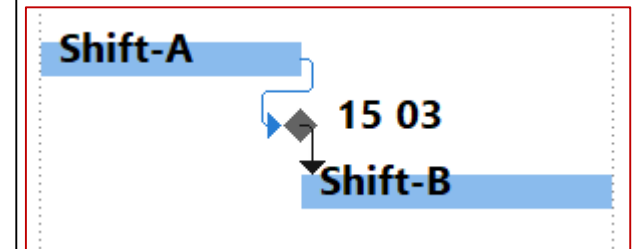
Activity Network Diagram
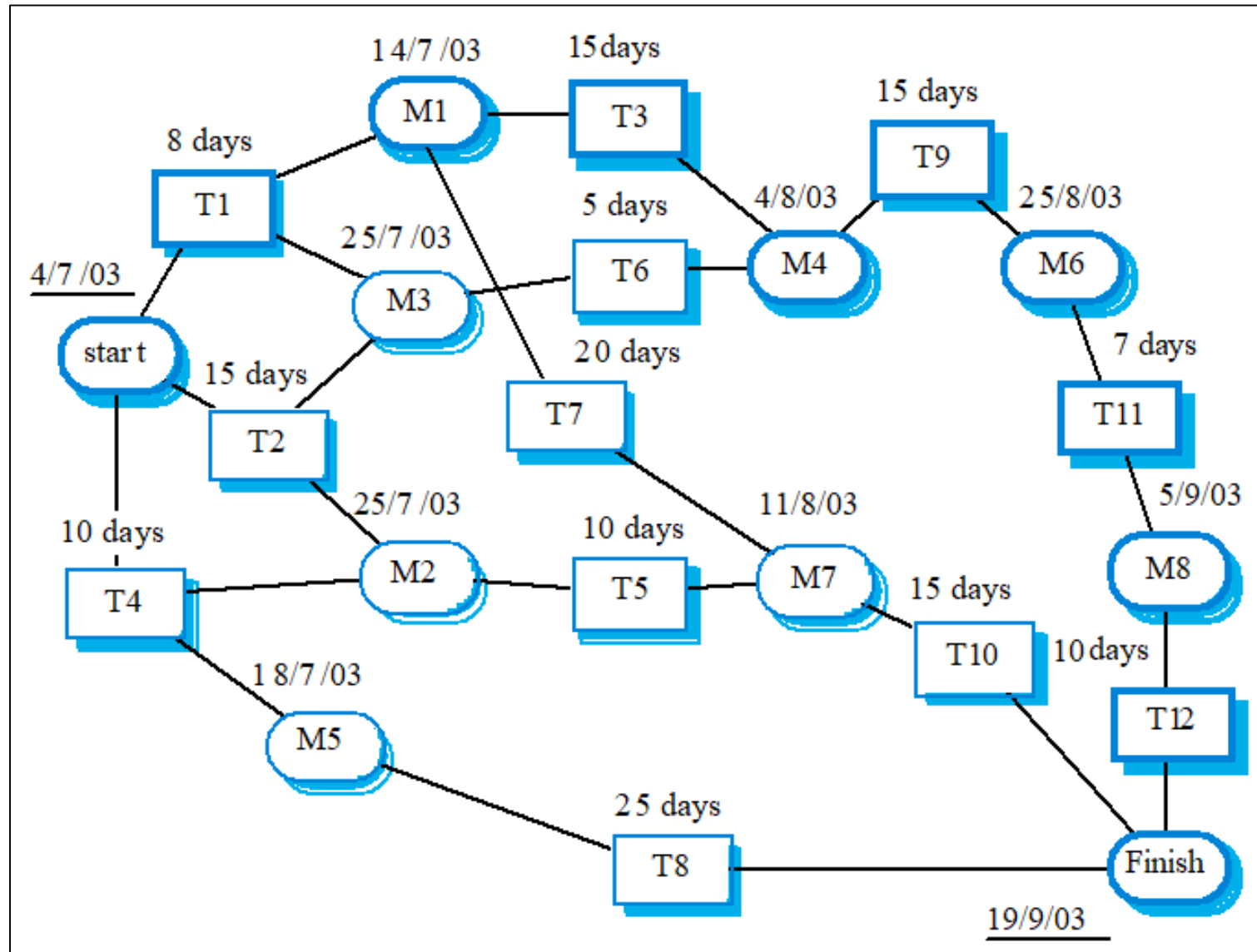
Bar Chart or Gantt Chart Diagram

Staff allocation

Critical Path Method

A project scheduling technique that determines the earliest possible project completion date or duration.

Techniques to arrive to a critical path:

- **Forward pass: Arrive to a finish date calculating from a start**

- **Backward pass: Arrive to a start date calculating from an end**

Critical Path Facts

- A critical path is typically the longest path in the network diagram

- Activities on the critical path has zero float

- Critical path may change during the course of the project

- There is definitely one critical path in the project

- There can be multiple critical paths in the project

- More are the critical paths; more is the schedule risk involved

Resource Estimation

Identifying what resources will be required in the project, at what time and in what quantity

- **Define resource attributes**
  - **Resource type (work, material, cost)**
  - **Resource calendar (working time, leaves)**
  - **Resource cost rate tables (if applicable)**
  - **Resource group(s)**

Work Resource	Example
Individual people identified by name	Ravinder; Arshad etc.
Individual people identified by job title or function	Director; camera operator etc.
Groups of people who have common skills	Electricians; carpenters etc.
Equipment	Camera; 600-watt light etc.

Schedule Development

Arriving to a final project schedule, with a schedule baseline and a cost baseline, considering all constraints & assumptions.

Work Breakdown Structure (WBS)

- **Breaking work into smaller tasks is a common productivity technique used to make the work more manageable and approachable.**

- **For projects, the <u>Work Breakdown Structure (WBS)</u> is the tool that utilizes this technique and is one of the most important project management documents.**

- **It integrates scope, cost and schedule baselines ensuring that project plans are in alignment.**

Types of WBS

- The Project Management Institute (PMI) Project Management Book of Knowledge (PMBOK) defines the Work Breakdown Structure as a "Deliverable oriented hierarchical decomposition of the work to be executed by the project team."

- There are two types of WBS:
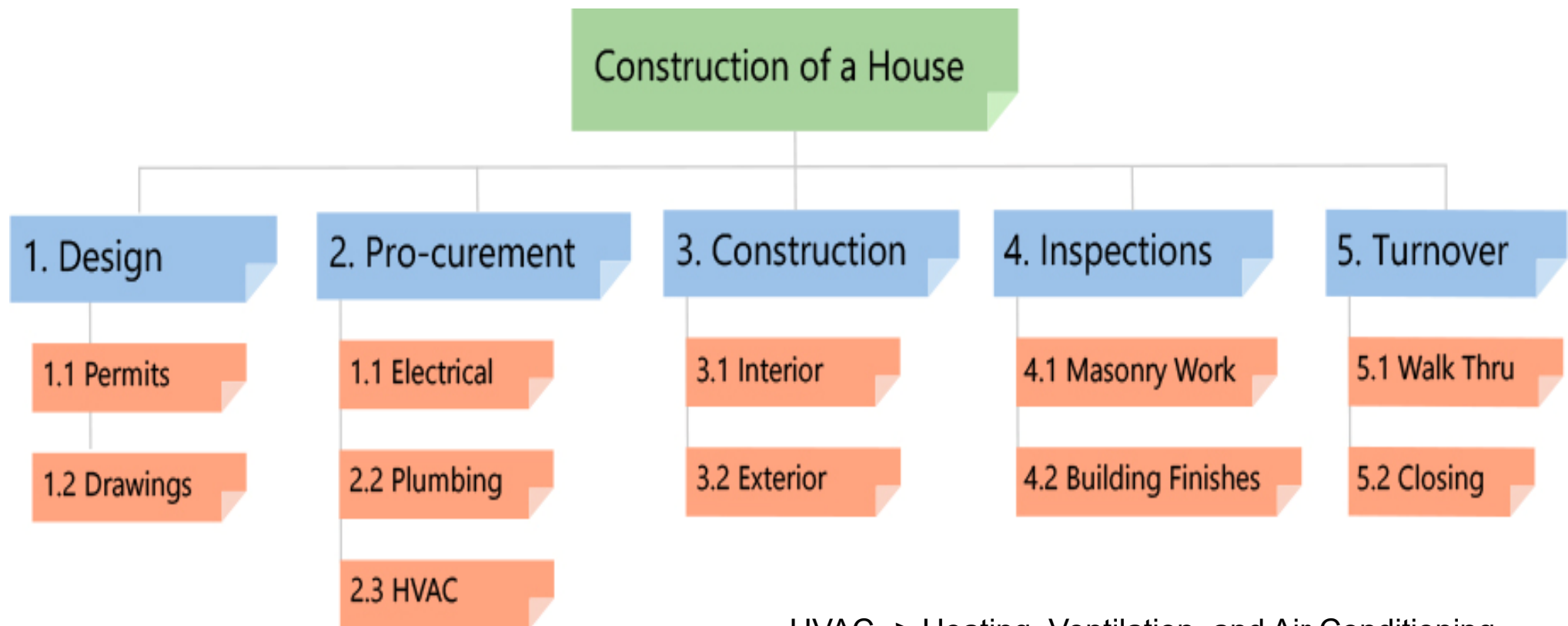 - ✓ 1) Deliverable-Based and
  - ✓ 2) Phase-Based.

Types of WBS: Deliverable-Based

A Deliverable-Based Work Breakdown Structure clearly demonstrates the relationship between the project deliverables (i.e., products, services or results) and the scope (i.e., work to be executed).
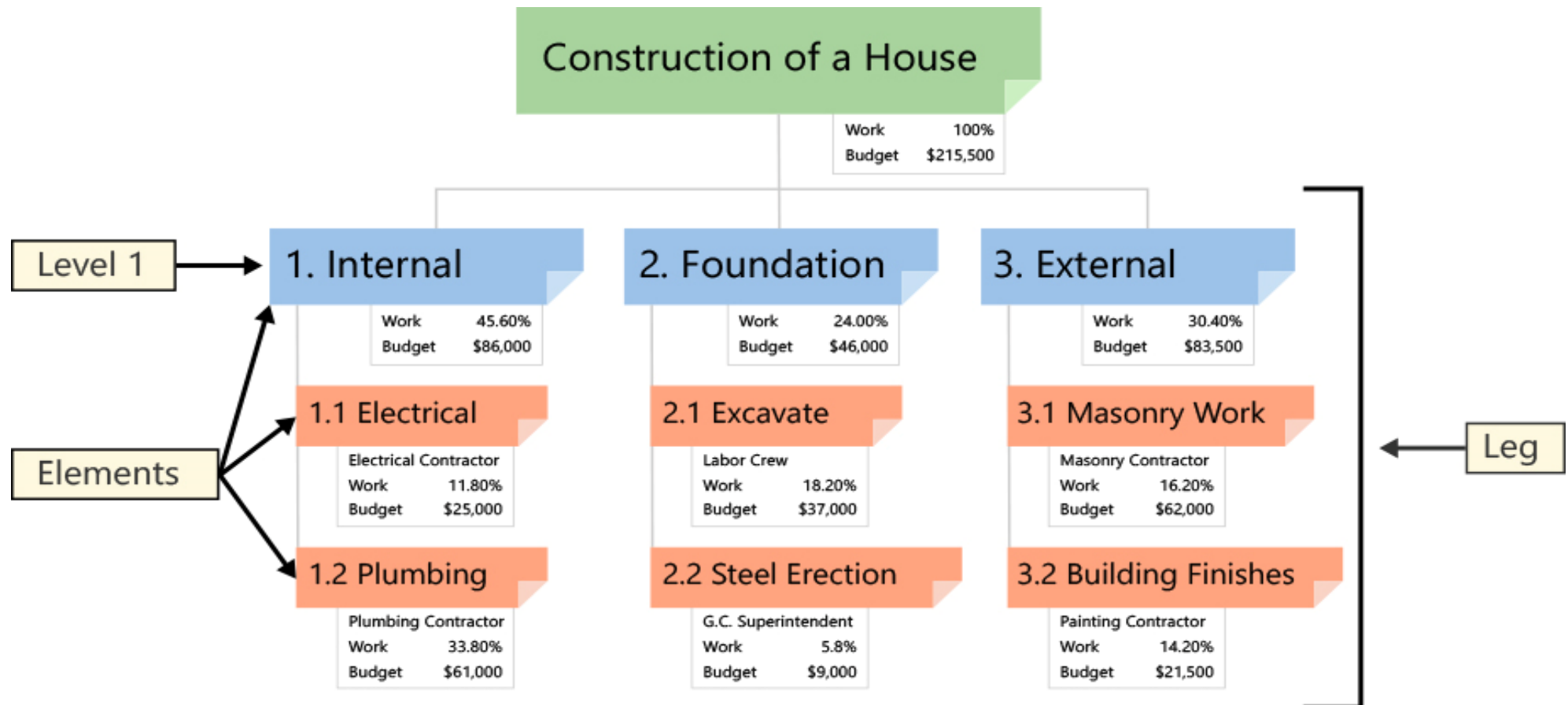
Types of WBS: Phase-Based

In the following figure, a Phase-Based WBS, the Level 1 has five Elements. Each of these Elements are typical phases of a project. The Level 2 Elements are the unique deliverables in each phase. Regardless of the type of WBS, the lower-Level Elements are all deliverables.

Construction of a House

1. Design
- 1.1 Permits
- 1.2 Drawings

2. Pro-curement
- 1.1 Electrical
- 2.2 Plumbing
- 2.3 HVAC

3. Construction
- 3.1 Interior
- 3.2 Exterior

4. Inspections
- 4.1 Masonry Work
- 4.2 Building Finishes

5. Turnover
- 5.1 Walk Thru
- 5.2 Closing

HVAC -> Heating, Ventilation, and Air Conditioning
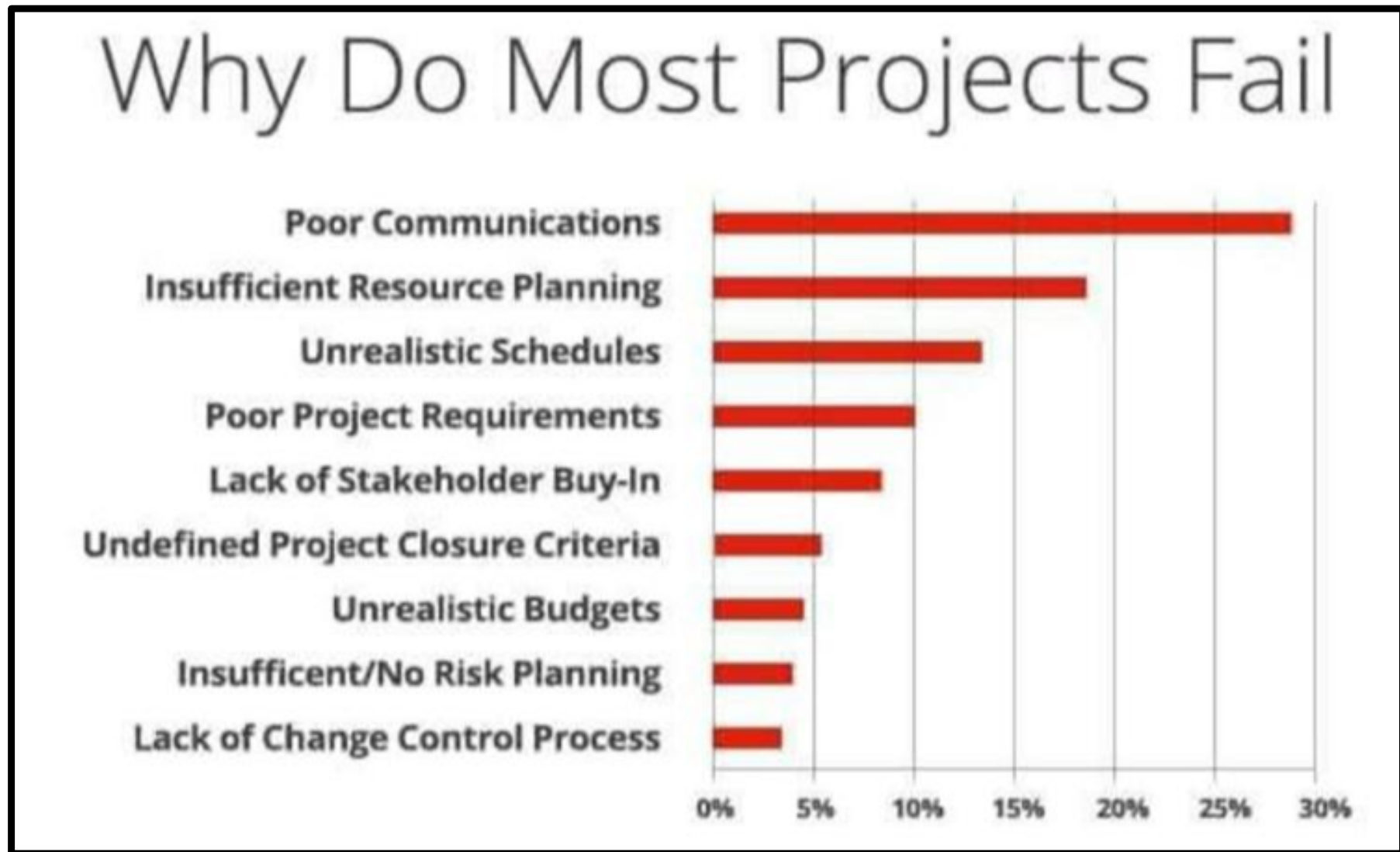
Project Monitoring and Control

Monitoring the overall project progress, ensuring it is as per the approved plan so that there is little or no variance, influencing the factors impacting the project to change, and taking preventive or corrective action as needed.

Project Variance

Difference between baseline and the actual work done or cost incurred is the Project variance

- **Positive (+) schedule variance implies project ahead of schedule**
- **Negative (-) schedule variance implies project behind schedule**
- **Positive (+) cost variance implies project under budget**
- **Negative (-) cost variance implies project over budget**

Why Do Most Projects Fail?

Why Do Most Projects Fail

- Poor Communications
- Insufficient Resource Planning
- Unrealistic Schedules
- Poor Project Requirements
- Lack of Stakeholder Buy-In
- Undefined Project Closure Criteria
- Unrealistic Budgets
- Insufficent/No Risk Planning
- Lack of Change Control Process

0% 5% 10% 15% 20% 25% 30%

Training Workshop on Project Management

MS project Features

❖ **Comprehensive planning and monitoring tool for projects**
❖ **Encompasses project time management completely**
❖ **Help manage project costs – people , material , machine cost**
❖ **Allows multiple base lining and measurement of project performance accordingly**
❖ **Generates various reports as deemed desirable during the project**
❖ **Facilitates performing various what – if scenarios**
❖ **Allows customization**
❖ **Integration with MS office application**
❖ **It has come thru a long way**

MS project 98 > MS project standard / professional 2000 > MS project standard / professional 2003 > MS project standard / professional 2007 (BETA) > MS project standard / professional 2010 > MS project standard / professional 2013

Key Definitions and Terminologies

❖ **Task:** An activity at the lowest level. Actual work done here, resource, duration, cost, work is estimated at task level.

❖ **Summary task:** A task that has more than one tasks under it. Work done at the task level, and resource, duration, work estimate made at the task level rolls up to summary task level.

❖ **Unit:** Number or resource (s) assigned against a task, depending upon their level of allocation.

❖ **Work:** Total effort required for a task (unit x duration).

❖ **Duration:** Difference between the finish date and the start date.

❖ **Effort:** Amount of time invested by the resource in performing and activity is considered to be directly proportional to the work completed.

❖ **Calendar:** Defining the working time, marking weekly offs, holidays etc. Scheduling calculations are based primarily on the calendars.
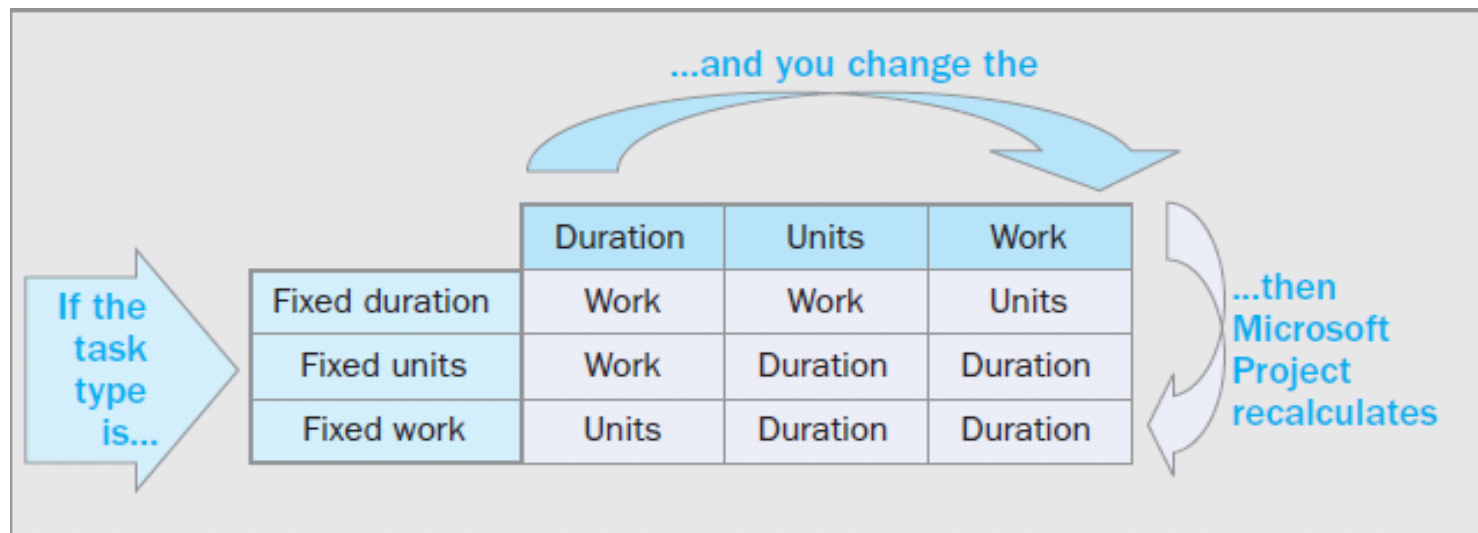
About Tasks

❖**Entering tasks:** Tasks are entered in the entry area, preferably sequential, without any blank row in between.

❖**Task Outlining:** Tasks are outlined to create a WBS using the "Indent & outdent" buttons.

❖**Entering Duration:** Durations are entered at sub-task level and can be entered in Minutes, Hours, days, weeks and months.

❖**Split Tasks:** A task can be split, if work is distributed.

❖**Recurring Tasks:** An activity that re-occurs during the project at regular intervals can also be scheduled in the plan.

❖**Sort, Filter, Group Tasks:** Tasks can be sorted, filtered or grouped, depending upon the requirement, without disturbing the actual WBS.

❖**Task information:** Double clicking on any tasks pops up a window which is the Task information box. Also known as the WBS dictionary.

ABOUT TASKS

Task types – Depending on the nature of activities tasks can be of three types
1.Fixed Units (Effort Driven/Non-Effort Driven) Default
2.Fixed Work (Effort Driven/Non-Effort Driven)
3.Fixed Duration

...and you change the

If the task type is...	Duration	Units	Work
Fixed duration	Work	Work	Units
Fixed units	Work	Duration	Duration
Fixed work	Units	Duration	Duration

...then Microsoft Project recalculates

Project uses a scheduling formula to calculate the different elements of a project schedule: Work = Duration x Resource Units.

About Tasks

Task Constraints – Depending upon the nature of activities, task can be constrained due to some dependencies and may need to be scheduled accordingly. There are eight types of task constraints:

1. Flexible
- ✓ **As Late As Possible**
- ✓ **As Soon As Possible Default**

2. Semi-Flexible
- ✓ **Finish No Earlier Than**
- ✓ **Finish No Later Than**
- ✓ **Start No Earlier Than**
- ✓ **Start No Later Than**

3. In-Flexible
- ✓ **Must Finish On**
- ✓ **Must Start On**

About Calendars

Multiple Calendars can be created, depending upon the requirement. Base calendars available are in following forms:

- **Standard**
- **Night Shift**
- **24 Hours**

Calendars can be applied to: *Project*
Resources
Tasks
Time Scale

Task get scheduled according to Project calendars. By default. Later the tasks calendar takes precedence and then the resource calendar takes precedence.

About Resources

Entering Resources – Resources are entered in the resource sheet. They can be either Generic or Actual

Applying attributes – Resource attributes a applied from the resource information dialog box. Attributes like – group ,work/material, units, cost, calendar etc

Assigning Resources – Resources are assigned from the entry sheet.

Resource leveling – Depending upon the task's schedules, resource allocation, resources may require leveling. There are multiple ways to level Resources – automatic, manual, setting work contours, increasing max units etc., as feasible.

LET US NOW GO FOR A CASE STUDY TO IMPLEMENT