No one plans to fail…

though they might fail to
plan.

Time is Money!

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**Project Scheduling**

- Simplest Scheduling:
  - Time Allocation
  - Personnel (few in number)

- Multi-faceted Large Scale Projects:
  - Time Allocation
  - Personnel (many groups or hundreds of people)
  - Material
  - Other Projects or Processes
  - Finances

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**How to Schedule?**

- What must be accomplished?
- When must it be accomplished by?
- When can it begin?
- What must happen in order for the project to be accomplished?

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**Project Scheduling**

- Deadlines
- Multiple Tasks
  - Sub-tasks
  - Sub-sub-tasks, etc.
- Client
- Management
- Project Leadership

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Graphical flow chart analysis of the build process.

Full analysis often includes the design process or at least elements of the design process, namely the creation of specification and drawings.

There is a balance to too much and not enough information, when creating a schedule that is sought.
Schedules

- Most Schedules are prepared in graphical format as either a Gantt chart or as a CPM/PERT chart.
- Typically, Gantt chart provide less detail and are targeted to Vice presidents or other high level administrators.
- CPM/PERT charts are typically more detailed, are meant for project leaders/schedulers, and focus on areas that could slow down production.

CPM

- Develop during WWII.
  - Manhattan Project.
  - Operation Overlord.
- Network of both sequential and parallel steps, with associated times to completion for each step.

CPM

- Know the appropriate steps
- Know the appropriate level of detail
- Know the appropriate order
- Know/estimate time for step completion

  The critical path is the one that control the minimum time to project completion (i.e. the path take is necessary and takes the longest).

CPM

- Project schedule is controlled by the cutout of the sprayer boom and its assembly and it addition to the other assemblies (1-4-5-6).
- Project is scheduled for 11 hours.
- Think of the critical path as both where time saved toward the project is beneficial, and/or the limiting step.

CPM Tasks

1. Name
2. Description
3. Time Required
4. Priori tasks
5. Personnel
6. Resources
**PERT**
- Develop during by NASA.
  - Especially useful during early missions.
- Network of both sequential and parallel steps, like CPM, but there are best case, normal, worst case time estimates and probabilities associated with each step.
- Probabilistic analysis generally requires significant computing power.

**Gantt**
- Typically much less detailed than a CPM or PERT analysis.
- Time is graphical represented by the horizontal axis.
- Tasks can be color coordinated and can be presented to show slack time, percent completed, and/or responsible parties.

**Gantt**
- Robot Structure, 11 hr complete time
  - Fabricate moveable sprayer boom parts
  - Cutout chassis parts
  - Wheel & axle assembly
  - Motor assembly
  - Robot structural assembly

**MS Project**
- Time is graphical represented by the horizontal axis.
- Tasks can be color coordinated and can be presented to show slack time, percent completed, and/or responsible parties.

**MS Project**
- Construct sprayer boom assemblies
- Construct moveable parts
- Fabricate moveable sprayer boom parts
- Cutout chassis parts
- Wheel & axle assembly
- Motor assembly
- Robot structural assembly

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**MS Project**
- Typical much less detailed than a CPM or PERT analysis.
- Time is graphical represented by the horizontal axis.
- Tasks can be color coordinated and can be presented to show slack time, percent completed, and/or responsible parties.
Gantt/CPM/PERT charts are just another form of communication, and are only as good as the weakest link in the organization.

Team meetings just revolving around project schedules are common, with the idea that everyone is given the opportunity to understand the schedule.

Project reviews provide the reality check for managers and schedulers.

Inexperienced schedulers tend to be overly optimistic, try to temper your optimism (as with anything in engineering, the higher the uncertainty, the higher the safety factor should be).