Project Time Management

- Activity Definition
- Activity Sequencing
- Duration Estimating
- Schedule Development
- Schedule Control
Activity Definition

Input
- Work Breakdown Structure
- Scope Statement
- Historical Information
- Constraints
- Assumptions
- Expert Judgment

Tools and Techniques
- Decomposition
- Templates

Output
- Activity List
- Supporting Detail
- Work Breakdown Structure
Activity Sequencing

**Input**
- Activity List
- Product Description
- Mandatory Dependencies
- Discretionary Dependencies
- External Dependencies
- Milestone

**Tools and Techniques**
- Precedence Diagram
- Arrow Diagram
- Conditional Diagram Method
- Network Template

**Output**
- Project Network Diagram
- Activity list update
  (Revise Activity list: delete or add act.)

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

GERT
System Dynamics Model: Loop Activity
Duration Estimating

**Input**
- Activity List
- Constraint
- Assumption
- Resource Requirement
- Resource Capability
- Historical data
- Risk Identification

**Tools and Techniques**
- Expert Judgment
- Analogous Estimating (similar past act)
- Quantitative based duration (unit rate)
- Reserve time

**Output**
- Activity duration estimate
- Basis of Estimate
- Activity List Update
Schedule Development

**Input**
- Project Network Diagram
- Duration Estimate
- Resource Requirement
- Resource pool description
- Work Calendar
- Time Constraint (dead line or milestone)
- Assumption
- Lead and Lag Time
- Risk Management Plan
- Activity Attribute

**Tools and Techniques**
- Mathematical Analysis
  - Critical Path Method
  - PERT
- Simulation
- Duration Compression
- Resource Leveling
- Project Management Software
- Coding Structure

**Output**
- Project Schedule
  - Bar chart
  - Network-based Schedule
- Support Detail
- Schedule Management Plan
- Resource Requirement Updates
Schedule Control

**Input**
- Project Schedule
- Performance Report
- Change Request
- Schedule Management Plan

**Tools and Techniques**
- Schedule change control system
- Performance measurement
- Additional Planning
- Project Management Software
- Variance Analysis

**Output**
- Schedule Update
- Corrective Action
- Lesson learned
Work Breakdown Structure

- a "check list" of work to be accomplished;
- a structured approach;
- the scope of the work, broken down into smaller and more specialized work;
- a document in which the major project work packages are identified;
- a document in which the major project outputs and responsibilities are defined; and
- an integration of schedule and budget.
allow better and more detailed planning;
facilitate the budget and schedule preparation process;
facilitate assignment of responsibility to organization and/or functional area; and
provide a structure for monitoring and reporting of project development and progress.
- Measurable
- Clear definition
- Deliverable
- Resource, Time and Cost assignable
- Acceptable duration
- Independent task
4.0 Training
  4.1 Equipment
  4.2 Services
  4.3 Facilities

6.0 Peculiar Support Equipment
  6.1 Test and Measurement Equipment
  6.2 Support and Handling Equipment

7.0 Common Support Equipment
  7.1 Test and Measurement Equipment
  7.2 Support and Handling Equipment

8.0 Operational/Site Activation
  8.1 System Assembly, Installation and Checkout on Site
  8.2 Contractor Technical Support
  8.3 Site Construction
  8.4 Site/Ship/Vehicle Conversion

9.0 Industrial Facilities
  9.1 Construction/Conversion/Expansion
  9.2 Equipment Acquisition or Modernization
  9.3 Maintenance

10.0 Initial Spares and Repair Parts

5.0 Data
  5.1 Technical Publications
  5.2 Engineering Data
  5.3 Management Data
  5.4 Support Data
  5.5 Data Depository
- **CPM: Critical Path Method**
  - Deterministic Time

- **PERT: Program Evaluation and Review Technique**
  - Stochastic Time
  - \( t = (a + m + b)/6 \)
  - \( v = ((b-a)/6)^2 \)
  - \( a \): optimistic time
  - \( m \): most likely time
  - \( b \): pessimistic time
  - Standard Deviation = Square Root (Variance)
Non CPM Scheduling

- Bar Chart
- Line of Balance
- Arrow Diagram
- Precedence Diagram