Planning Value

VS

Earned Value

Leslie (Les) Dupaix
USAF Software
Technology Support Center
les.dupaix@hill.af.mil
(801) 775-2064
DSN: 775-2064

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
MAY 2011		**00-00-2011 to 00-00-2011**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Planning Value vs Earned Value	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **USAF Software Technology Support Center,Hill AFB,UT,84056**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
Presented at the 23rd Systems and Software Technology Conference (SSTC), 16-19 May 2011, Salt Lake City, UT.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**26**	

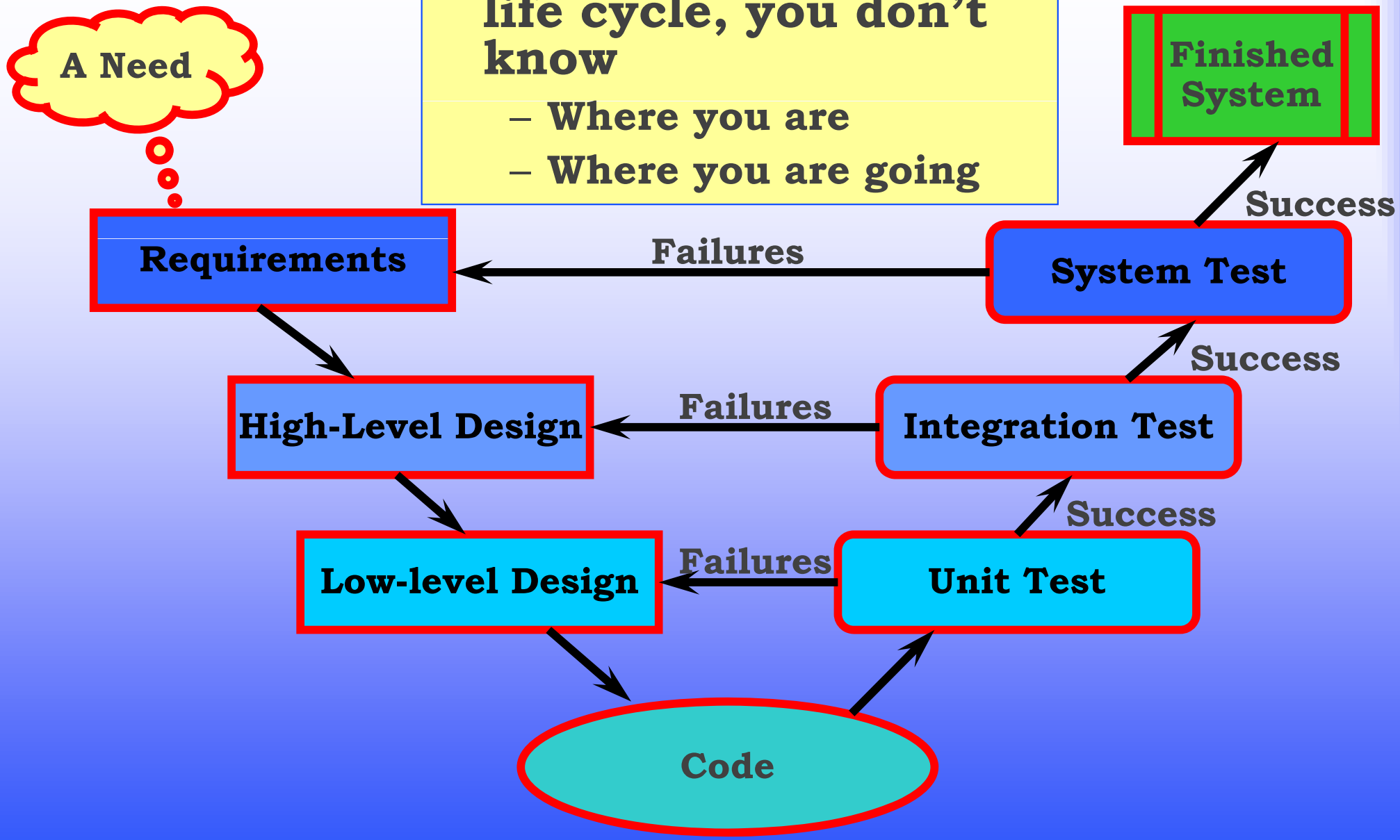
Topics

- Lifecycles
- Development
- Planning Value
- Stones to Pebbles
- Pebble Values
- Earning Value
- Communication

Get a Life(cycle)

If you don't have a life cycle, you don't know

- Where you are
- Where you are going



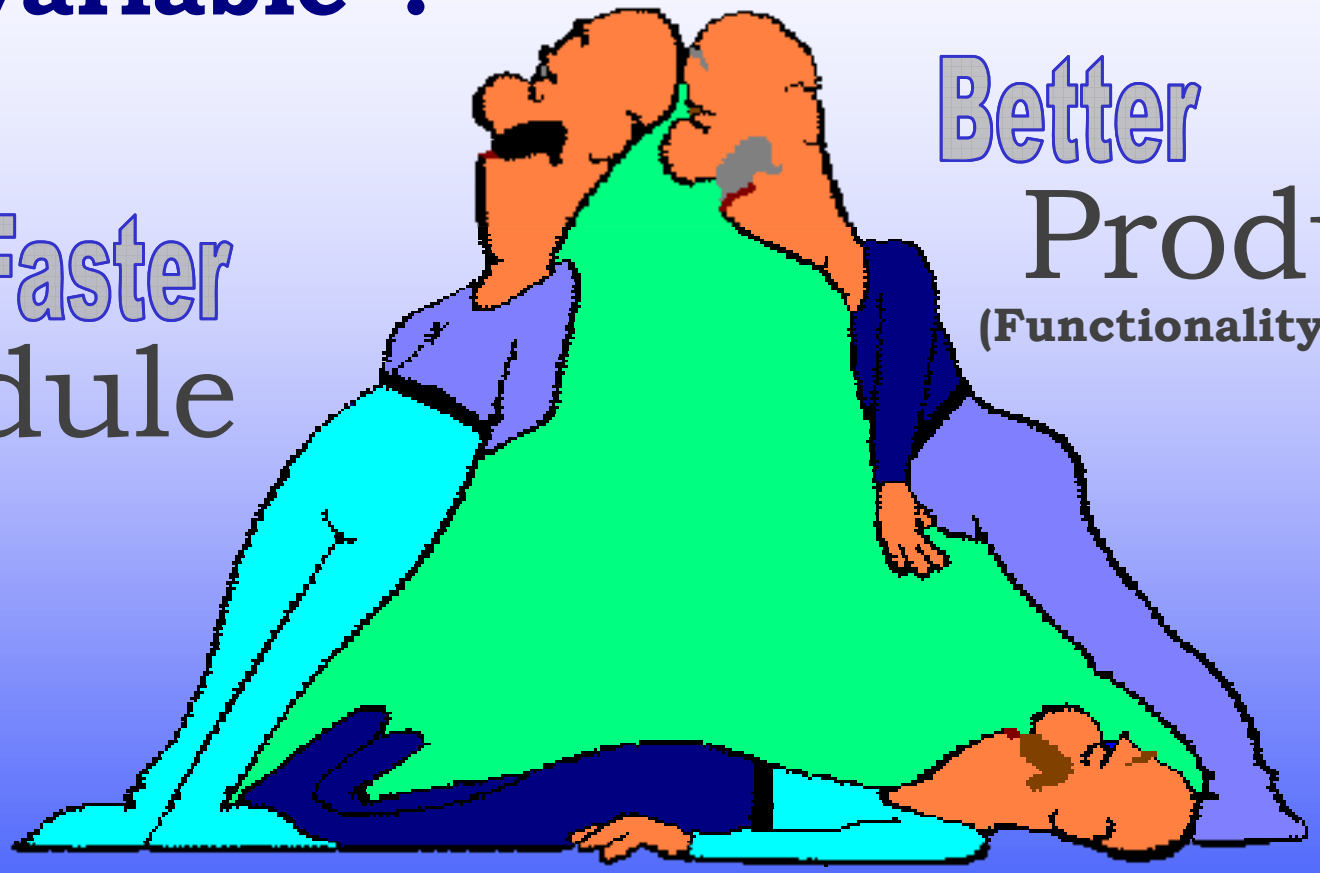
Lifecycles Strengths and Weaknesses

Capability	*Pure Waterfall*	*Code- and - Fix*	*Spiral*	*Modified Waterfall*	*Prototype*
Poorly understood requirements	Poor	Poor	Excellent	Fair to Excellent	Excellent
Poor Architecture	Poor	Poor	Excellent	Fair to Excellent	Poor to Fair
Highly Reliable System	Excellent	Poor	Excellent	Excellent	Fair
System Growth Built in	Excellent	Poor to Fair	Excellent	Excellent	Excellent
Risk Management	Poor	Poor	Excellent	Fair	Fair
Predefined Schedule	Fair	Poor	Fair	Fair	Poor
Midcourse Correction	Poor	unknown	Fair	Fair	Excellent
Customer Visibility	Poor	Fair	Excellent	Fair	Excellent
Management Visibility	Fair	Poor	Excellent	Fair to Excellent	Fair
Low Management and developer skill level	Fair	Excellent	Poor	Poor to Fair	Poor
Low Overhead	Poor	Excellent	Fair	Excellent	Fair

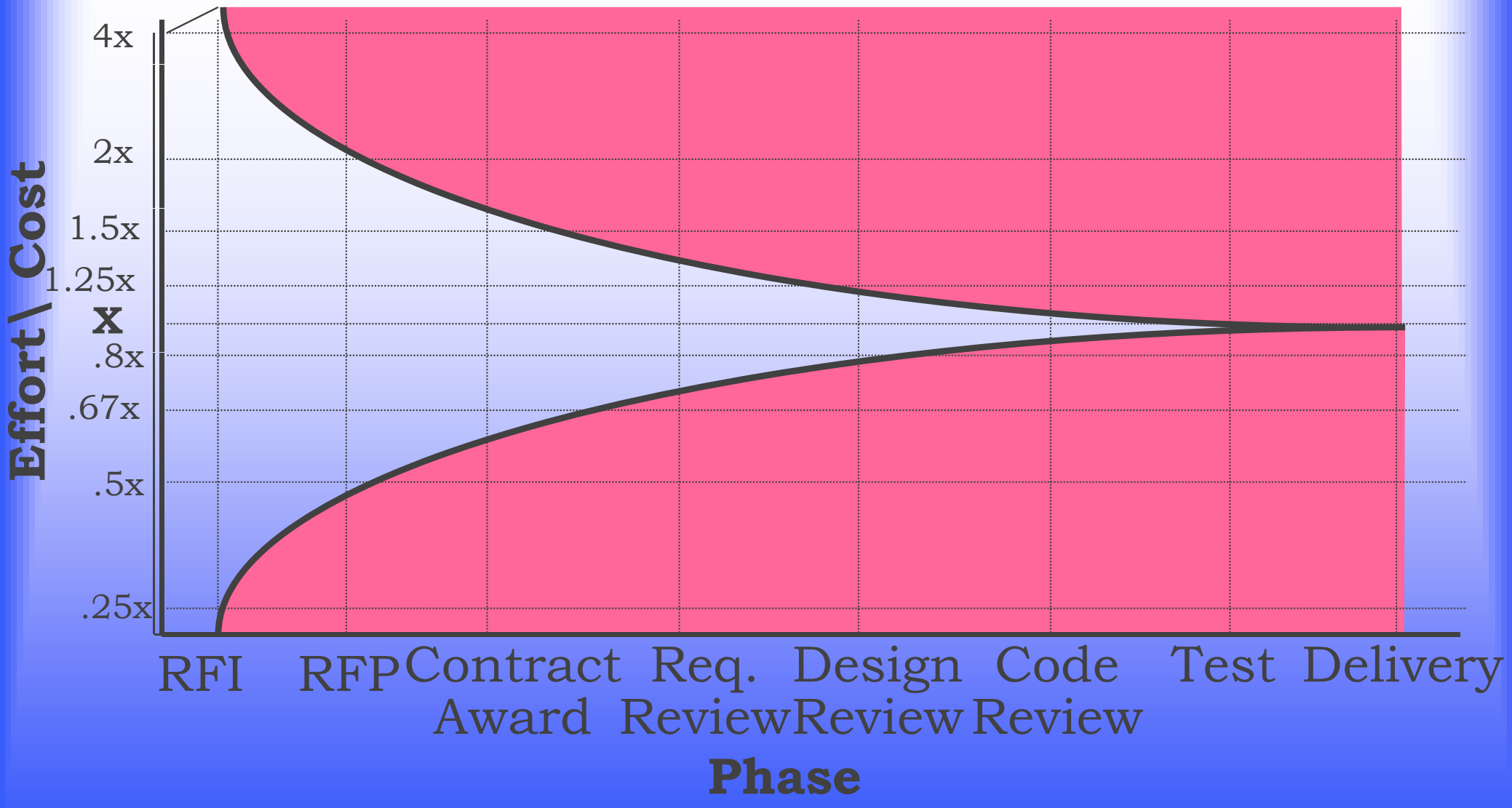
Rapid Development (McConnell, 96)

The Development Triangle

You can control only two sides of a triangle; The third side MUST be a "free variable".

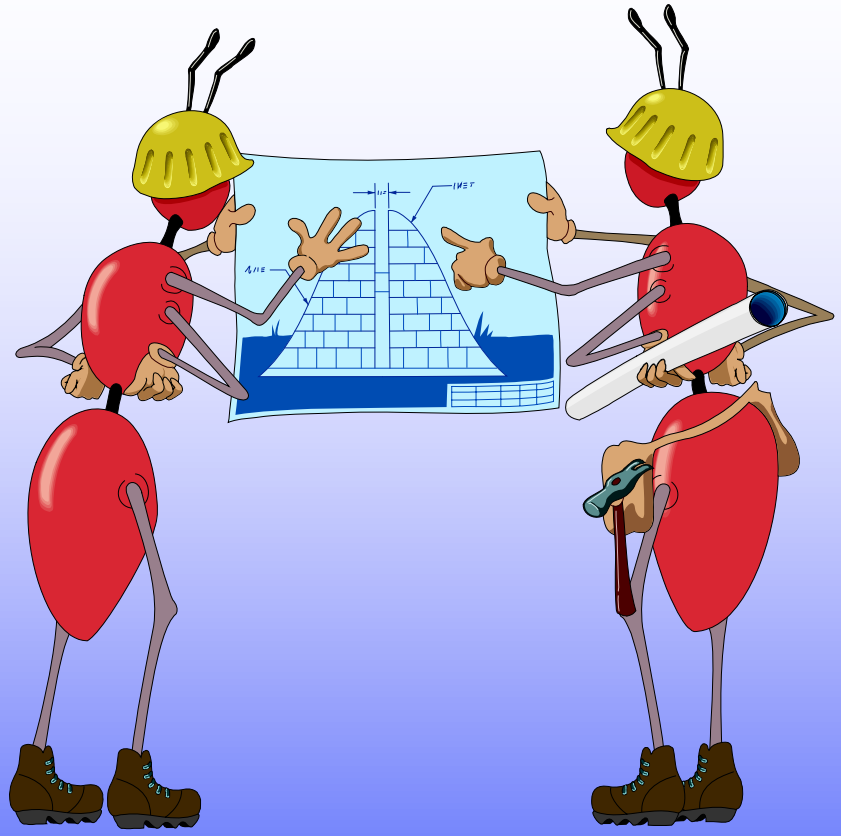


Change Possibility



Planning Value

- Plan a value for each phase and task.
- All phases sum to the total project.
- All tasks sum to each phase.
- The planned value for each task is the percent of the value for phase.
- Simple measures are the best and easiest.

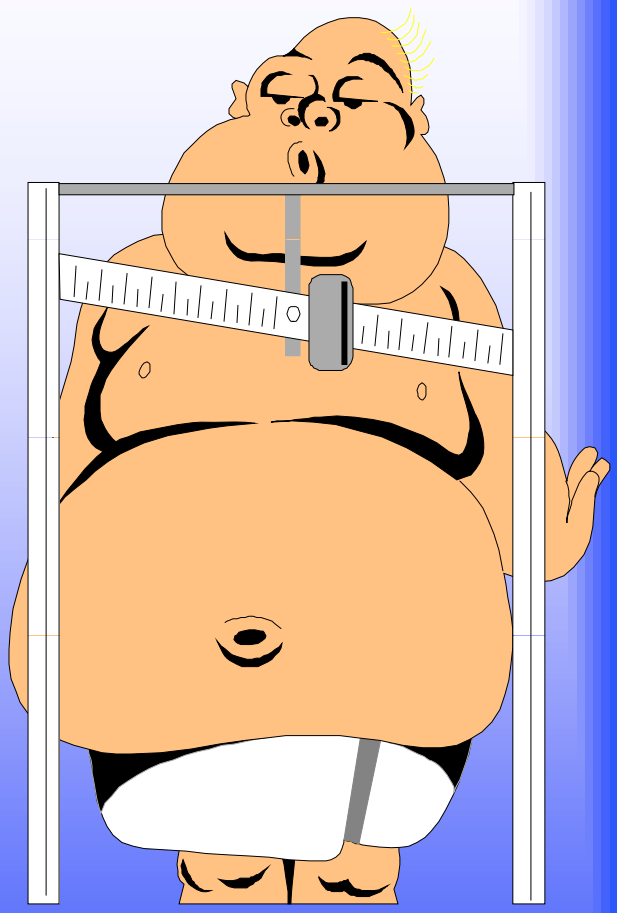


Plan Example

Task #	Task Description	Plan Hours	Cum Hours
1	Presentation Plan	1	1
2	Presentation Outline	2	3
3	Create Presentation	12	15
4	Review Presentation	3	18
5	Present	1	19
6	Postmortem	1	20

Plan Value Example

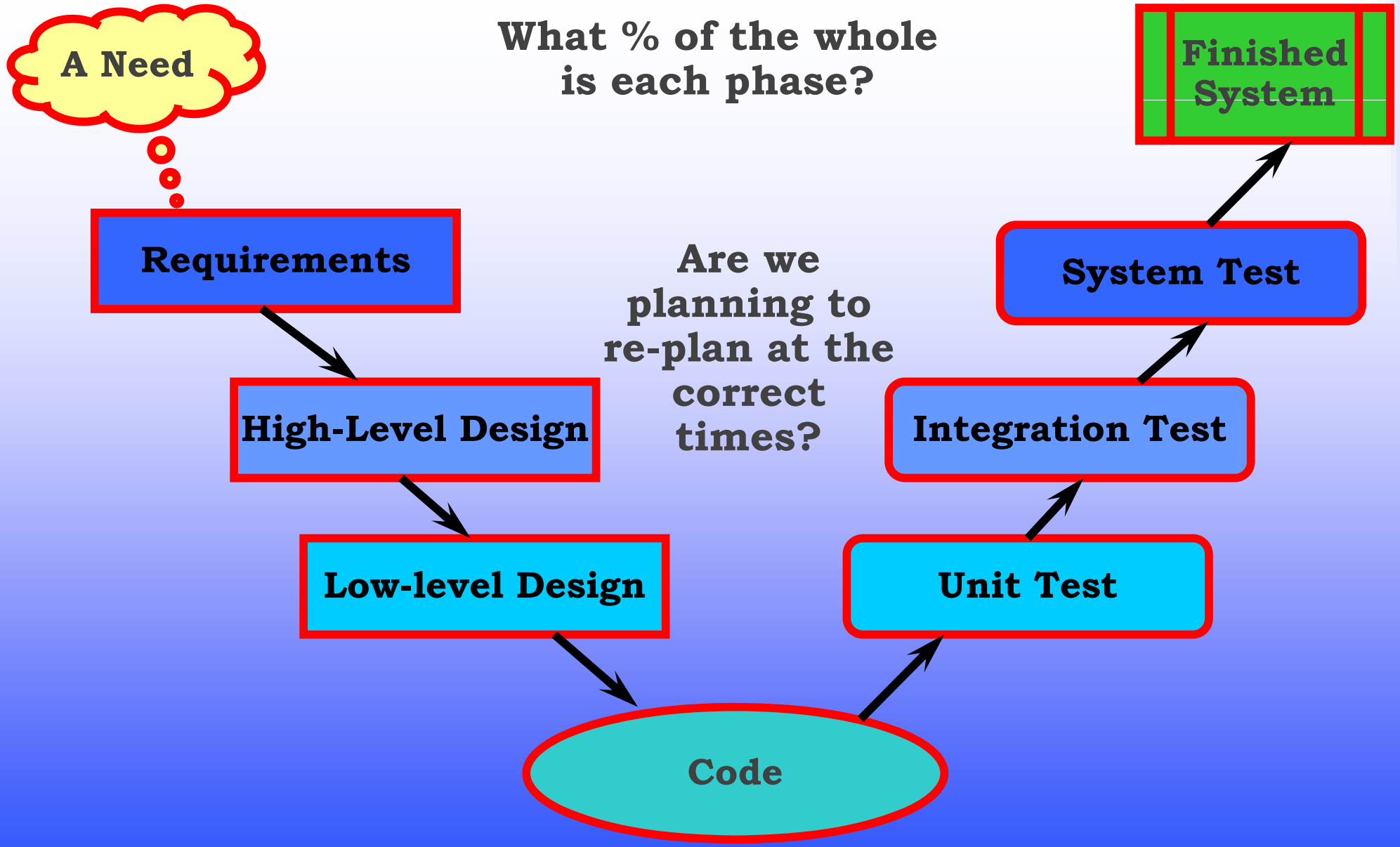
Task #	Task Description	Plan Hours	Cum Hours	Plan Value	Cum Value
1	Presentation Plan	1	1	5	5
2	Presentation Outline	2	3	10	15
3	Create Presentation	12	15	60	75
4	Review Presentation	3	18	15	90
5	Present	1	19	5	95
6	Postmortem	1	20	5	100

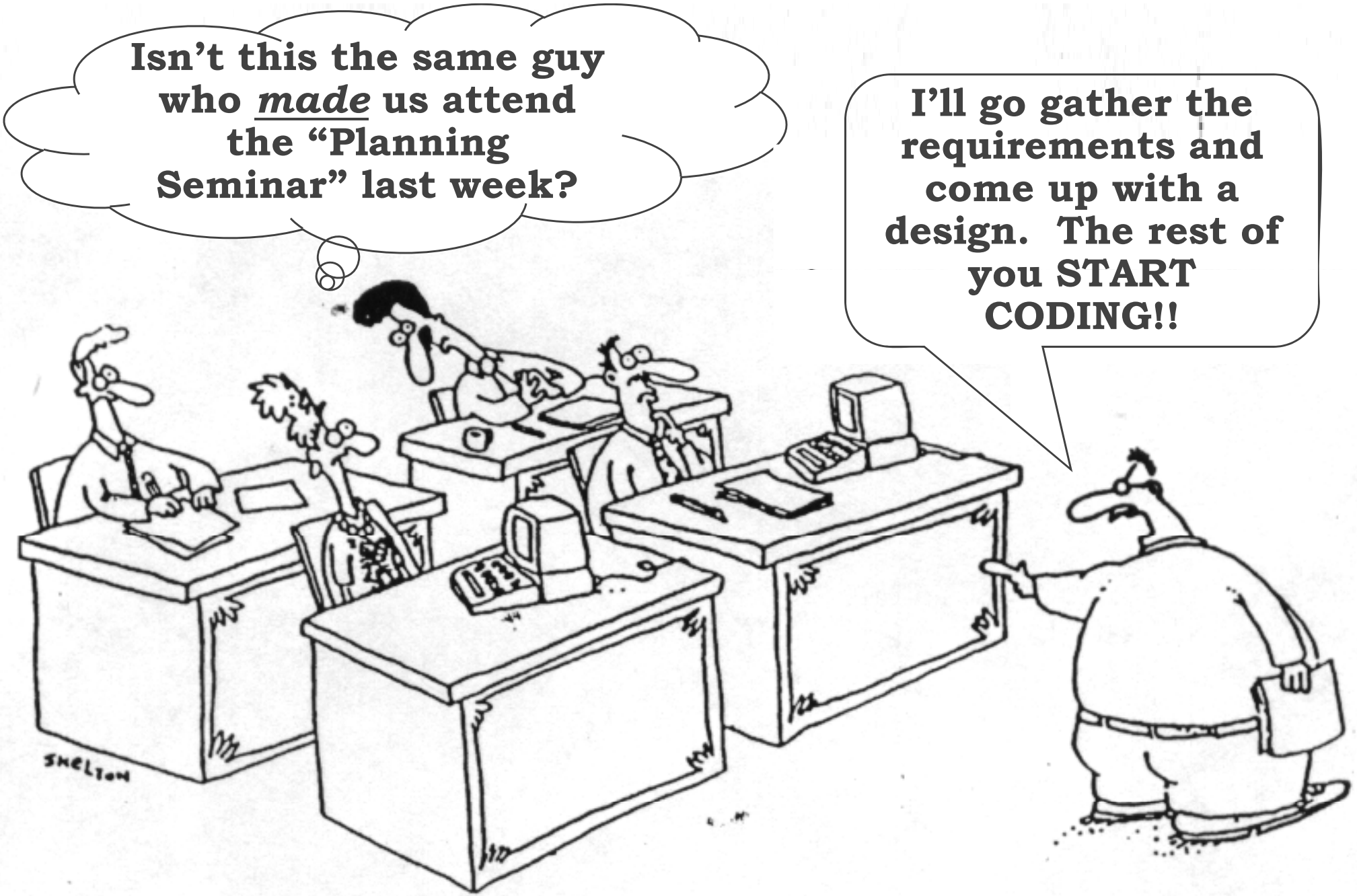


Plan Value Example with Schedule

Task #	Task Description	Plan Hours	Cum Hours	Week Plan	Plan Value	Cum Value
1	Presentation Plan	1	1	1	5	5
2	Presentation Outline	2	3	1	10	15
3	Create Presentation	12	15	3	60	75
4	Review Presentation	3	18	4	15	90
5	Present	1	19	5	5	95
6	Postmortem	1	20	5	5	100

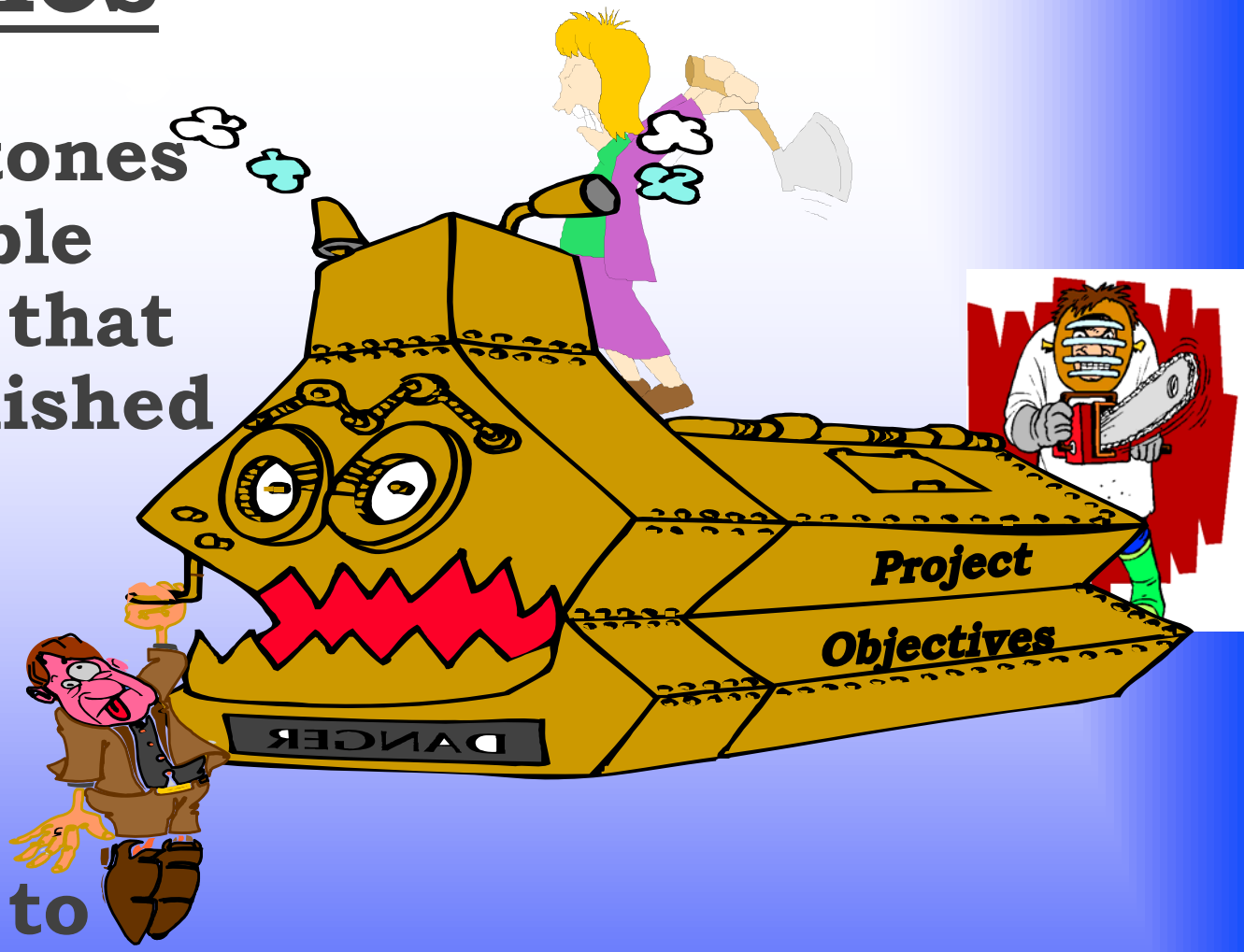
Planning Milestones




Isn't this the same guy who *made* us attend the "Planning Seminar" last week?
I'll go gather the requirements and come up with a design. The rest of you START CODING!!
SHELTON

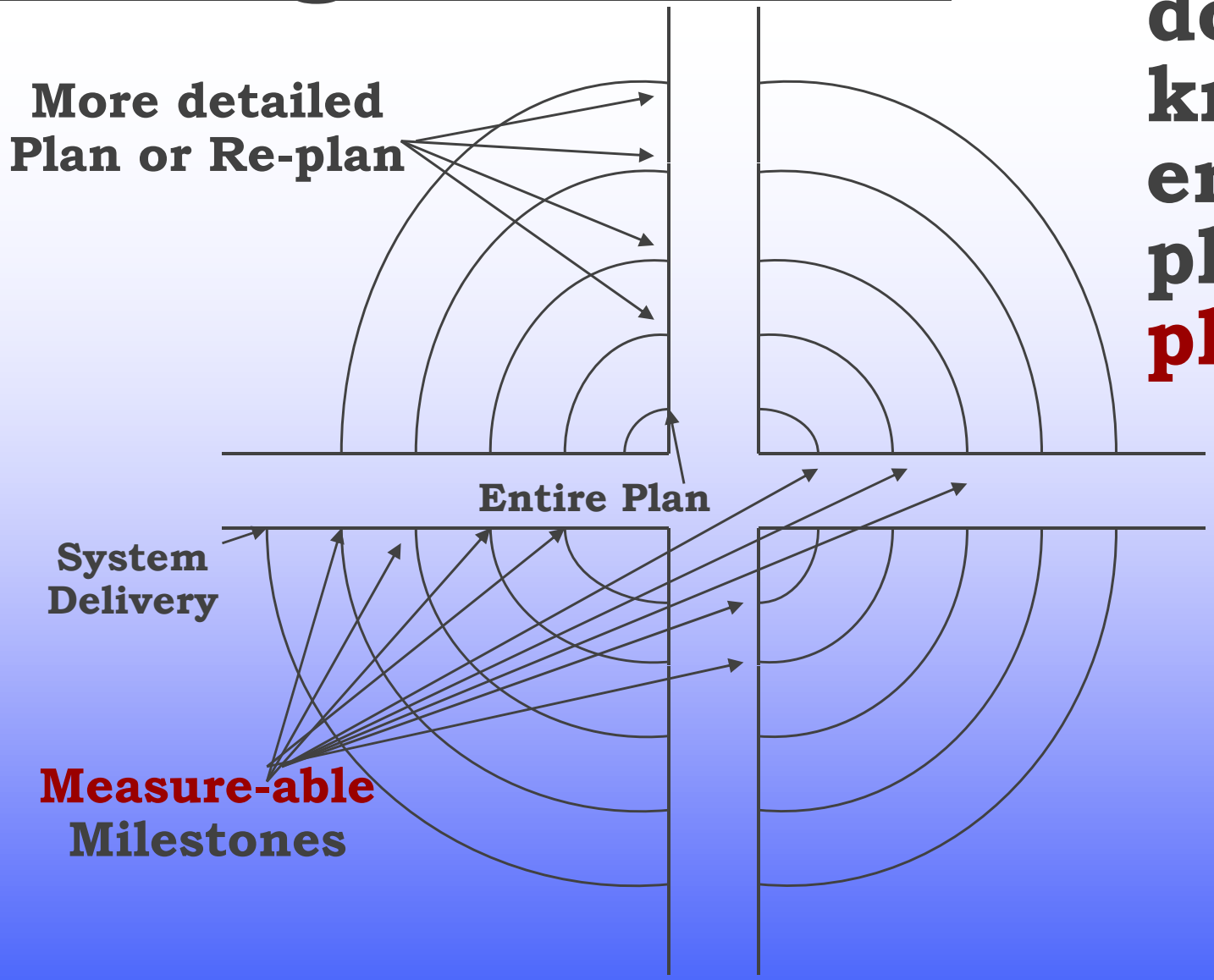
Slicing Milestones to Inch Pebbles

- Separate Milestones into Measure-able individual task that can be accomplished
  - Review document
  - Identify interfaces
  - Write test plan



- Identify inputs to and outputs from each task (including Critical Path)

Planning Milestones

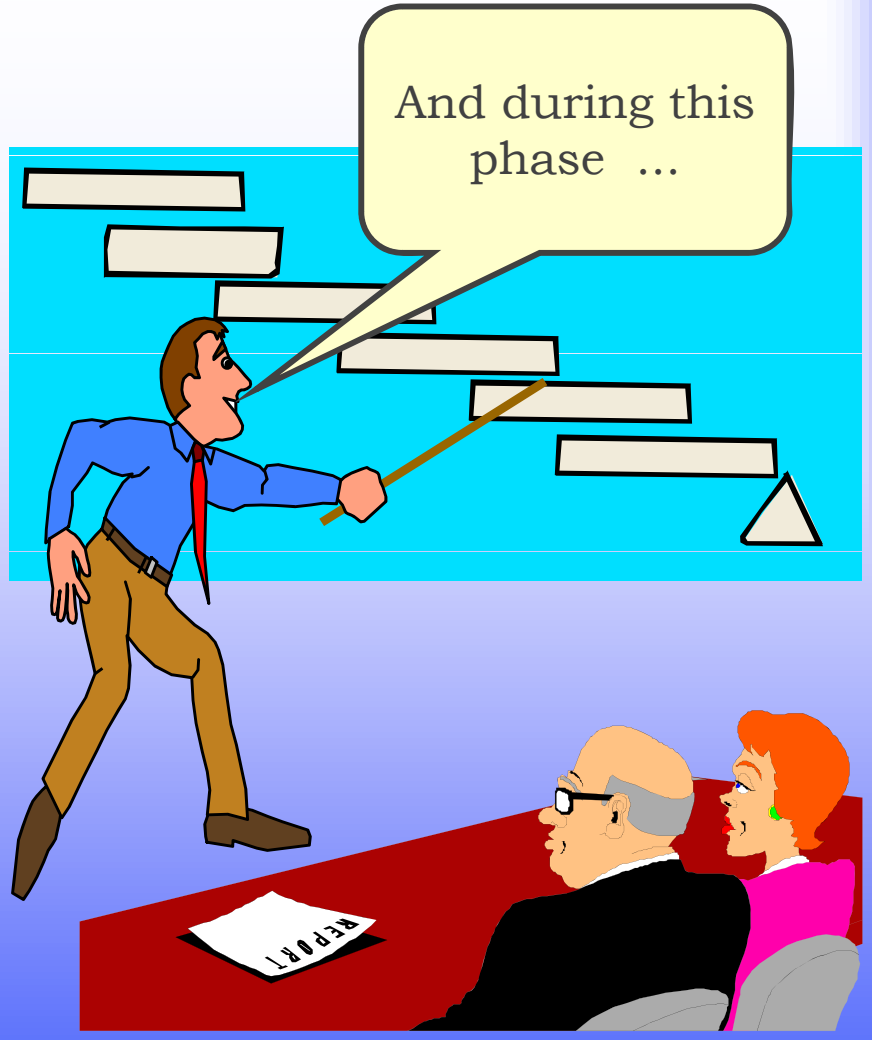


If you don't know enough to plan well, plan often.

Know the critical path.

Example - Iterative Approach

- **Phase I** 35%
  - Planning 7.5%
    - Entire Project 5%
    - Phase 2.5%
  - Requirements 25%
  - Design 25%
  - Code 30%
  - Test 12.5%
- **Phase II** 30%
  - Planning 2.5%
  - Requirements 25%
  - Design 25%
  - Code 30%
  - Test 12.5%
- **Phase III** 30%
  - Planning 2.5%
  - Requirements 25%
  - Design 25%
  - Code 30%
  - Test 12.5%
- **System Test** 5%



Plan Value Example

Phase I

Task #	Task Description	Plan Hours	Cum Hours	Plan Value	Cum Value
1	Project Plan	200	200	5	5
2	Phase Plan	100	300	2.5	7.5
3	Requirements	1000	1500	25	32.5
4	Design	1000	2500	25	57.5
5	Code	1200	3700	30	87.5
6	Test	500	4200	12.5	100

Detailed Planned Value Example

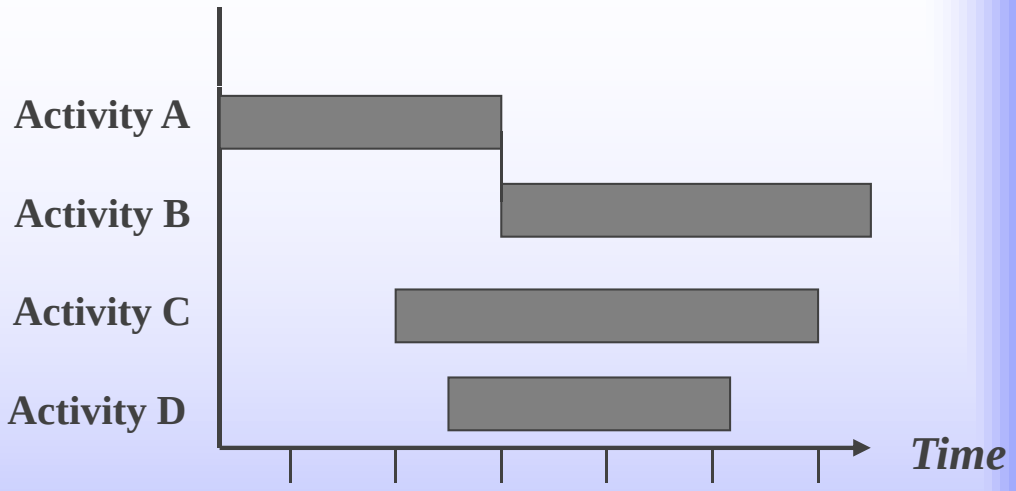
Project Plan (part of Phase I)

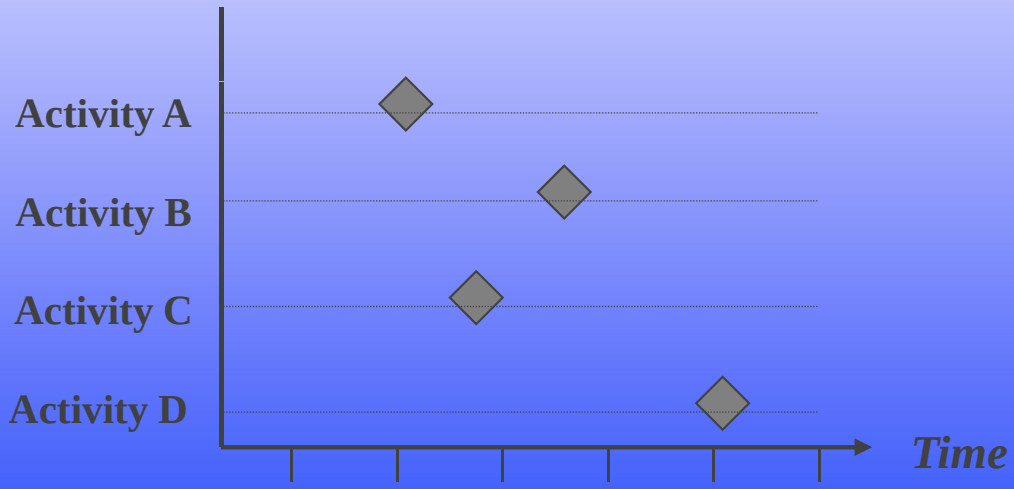
Task #	Task Description	Plan Hours	Cum Hours	Plan Value	Cum Value
1	Identify Resources for each Phase	8	8	4	4
2	Identify Requirements	78	86	39	43
3	Match Requirements to Phases	20	106	10	53
4	Identify Risk Areas	20	126	15	63
5	System Test Plan	50	176	25	88
6	Review	20	196	10	98
7	Postmortem	4	200	2	100

Including Critical Path

Duration Charts

- Gantt (Bar) Chart
  - Simple
  - Can show dependencies
  - Tracking planned vs actual
- Milestone
  - Markers showing progress
  - Doesn't show consumption of resources
  - Normally part of Gantt chart
  - *Zero duration*

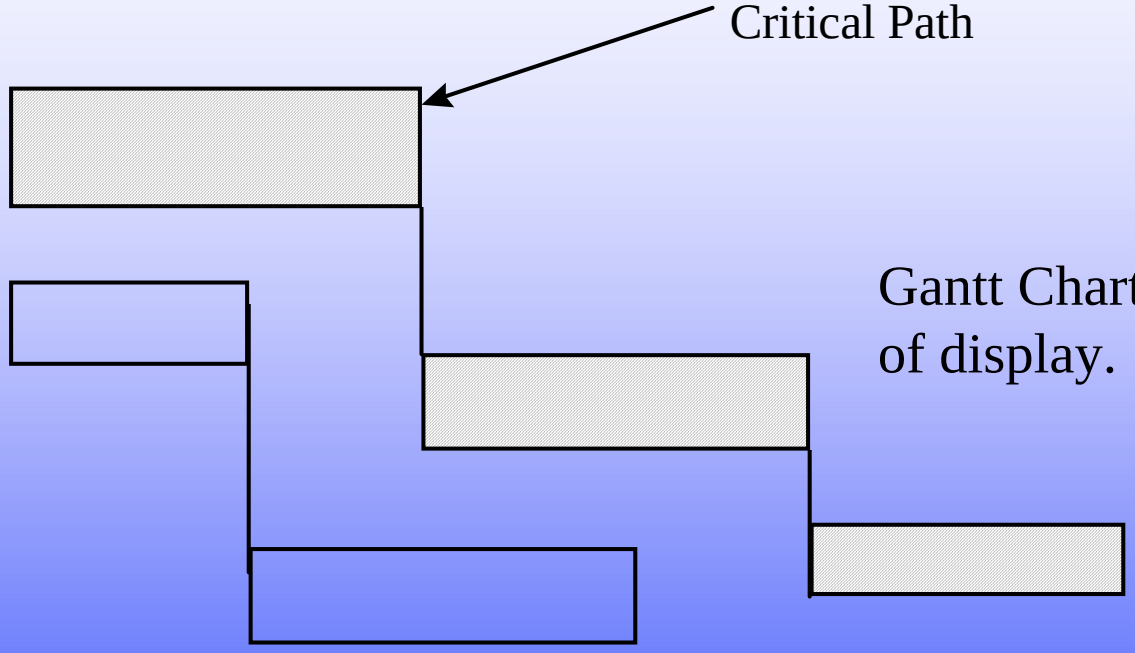




Critical Path Method (CPM)

- **Network analysis technique**
  - **Used to predict project duration by analyzing path with least amount of float**
  - **Early dates: Forward pass calculation**
  - **Late dates: Backward pass calculation**
- **Critical path**
  - **The series of activities determining the earliest completion**
  - **Usually defined as activities with float < or = a specified value (often zero)**

Critical Path Method



Gantt Chart is common method of display. Can also be a pert chart.

Rebuilding Milestones from Inch Pebbles

- To make a schedule you need 3 things
  - the estimated direct project hours
  - a calendar of available direct hours
  - the order in which the tasks will be done

- You then need to
  - estimate the hours needed for each task
  - spread these hours over the calendar of available hours
  - Make sure you check and recheck *Critical Path*

Earning Value

- You earn value when you **complete** a task
- No partial credit

Earned Value Example

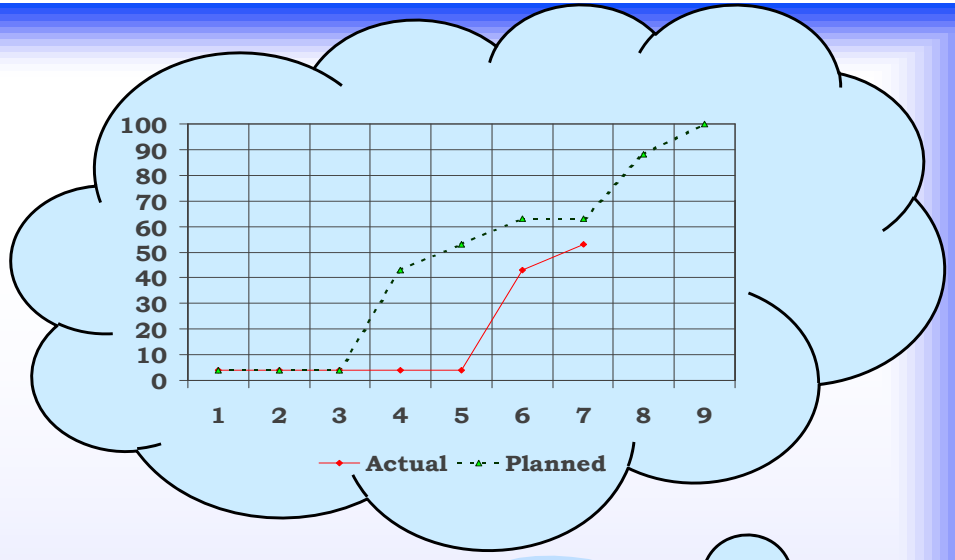
Project Plan (part of Phase I)

Task #	Task Description	Plan Hours	Cum Hours	Plan Value	Cum Plan Value	Plan Week	Week	Hours	Actual Hours Cum	Cum Earned Value
1	Identify Resources for each Phase	8	8	4	4	1	1	7	7	4
2	Identify Requirements	78	86	39	43	4	6	96	103	43
3	Match Requirements to Phases	20	106	10	53	5	7	24	127	53
4	Identify Risk Areas	20	126	10	63	6				
5	System Test Plan	50	176	25	88	8				
6	Review	20	196	10	98	9				
7	Postmortem	4	200	2	100	9				

Only get credit on the week completed

Status Reporting

- Status is earned compared to planned
- When earned and plan get too far off balance ***Re-Plan***
- ***Remember life happens***
- ***You probably never can catch up***



Communication

- Large-scale software requires many people - and without a process, there is little (if any) effective communication.
- Earned value versus planned value can be a simple sanity check

Questions