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DEFINING THE FUTURE

Calibrating the Project Planning Process

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stems Sector

- A leading integrator of complex, mission-enabling systems
- 2006 Sales - ~$5.5B
- 17,500 employees in 47 states, 18 countries
- 2500 active contracts
- Deep, legacy domain expertise in priority, high-growth segments
- Trusted provider of mission critical end-to-end solutions

Focused on Program Performance

Data reflects 2006 results realigned for 2007 organization

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Today we'll discuss…

- The problem of protecting due-date performance
- How to "calibrate" your Project Planning Process, that is, determine the systematic error
- Mechanically, how to get data from Microsoft® Project to Minitab®

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- Often projects have difficulty finishing on time
- Often projects have difficulty staying within budget
- Often agreed to scope or specifications are cut from a project to maintain cost or schedule
- All result in Customer irritation and perhaps undesirable consequences for the Project Manager

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nager's Dilemma

Requirement

Prerequisite

Objective

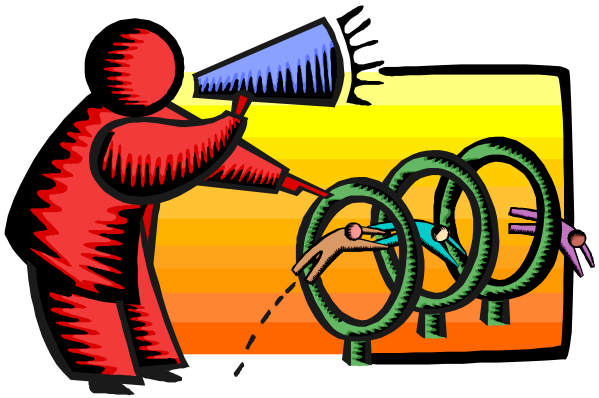
Complete Projects on Time (to be realistic)

Add protection to tasks

Be a good Project Manager

Respond to Customer's need for Short Lead Time (quick response)

Don't add protection to tasks



Requirement

Prerequisite

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ons why projects may under

- Inadequate or poorly defined requirements
- Competing priorities
- Clients changing their mind
- Unforeseen events (Murphy)
- Poor communications
- Unsatisfactory means of measuring progress
- Key people not available when needed
- Pressure to meet unrealistic due dates
- Factors outside our control
- Essential information not available on-time (designs, specifications, materials and authorizations)
- Too much re-work
- Lack of leadership or good management

Need “protection” from these factors

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This is not intended to be a dissertation on Critical Chain, just borrowing some ideas

- Eliyahu Goldratt in his Critical Chain theory suggests that projects create buffers to protect due-date performance
- Project buffers are “zero-resource-tasks” in schedules that absorb the risks inherent in planning
- The issue for the Project Planning Process is to determine how big, and where to place these buffers in a project schedule

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rences in project management

CRITICAL PATH

- Places high value on the completion of tasks on time,
- Employs techniques to minimize slack or float,
- Uses the amount of slack or float to set priorities

CRITICAL CHAIN

- Places low value on tasks being completed on time,
- Inserts buffers even on paths that are critical,
- Manages buffers to minimize unplanned expediting, overtime and other costly deviations from schedule

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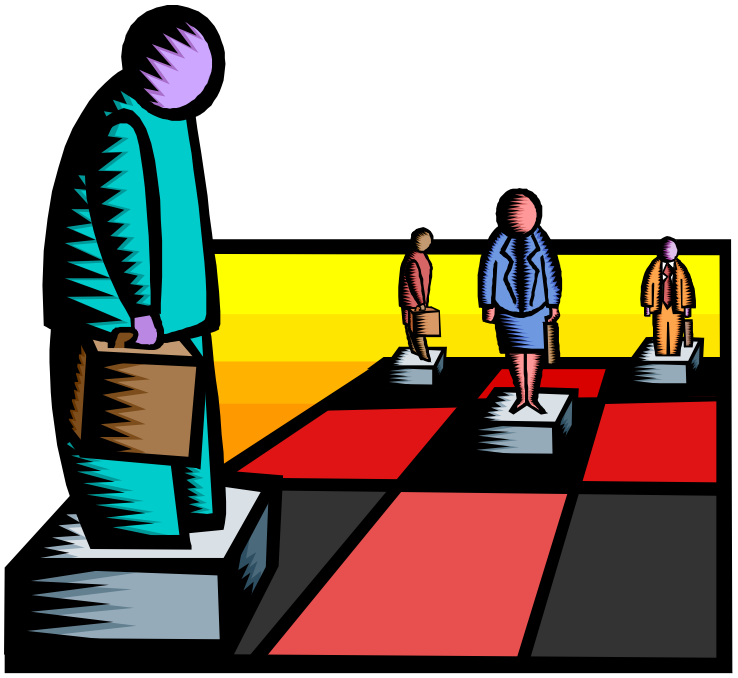

- Track both the baseline and actual durations of project tasks
- “Chunk” the project plan so tasks aren’t too different in size
- Analyze plan error with Xbar charts and Capability Charts
- Use information to develop “zero-resource-buffers” that protect due-date performance (by WBS or functional area)

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ox" that you will need

- Microsoft® Project
- Microsoft® Excel
- Minitab®

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odology considerations

- Task durations are relatively independent; Start/Finish dates are not
- Task durations seldom are normally distributed which always presents analytic challenges
- Charting the averages of averages tends to produce normally distributed data even where the underlying data are not
- Large projects often have hundreds of tasks - presenting all the data points overwhelms the audience

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gh example of a simple software

Shows an approach to get data from Microsoft® Project to Mintab® to analyze schedule performance

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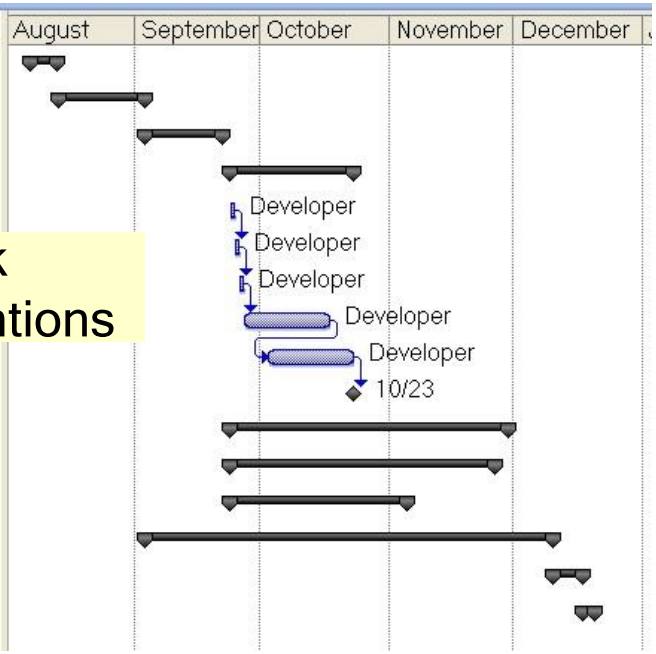
project plan

Summary tasks (aggregate subtasks)

	Task Name	Duration	Start	Finish
1	⊞ Scope	4.5 days?	8/7/2007	8/13/2007
7	⊞ Analysis/Software Requirements	15 days?	8/13/2007	9/3/2007
17	⊞ Design	14.5 days?	9/3/2007	9/21/2007
25	⊟ Development	21.75 days?	9/24/2007	10/23/2007
26	Review functional specifications	1 day?	9/24/2007	9/24/2007
27	Identify modular/tiered design parameters	1 day?	9/25/2007	
28	Assign development staff	1 day?	9/26/2007	
29	Develop code	15 days?	9/27/2007	
30	Developer testing (primary debugging)	15 days?	10/2/2007	10/23/2007
31	Development complete	0 days?	10/23/2007	10/23/2007
32	⊞ Testing	48.75 days?	9/24/2007	11/29/2007
48	⊞ Training	45.75 days?	9/24/2007	11/26/2007
57	⊞ Documentation	30.5 days?	9/24/2007	11/5/2007
67	⊞ Pilot	70.25 days?	9/3/2007	12/10/2007
74	⊞ Deployment	5 days?	12/10/2007	12/17/2007
81	⊞ Post Implementation Review	3 days?	12/17/2007	12/20/2007



Task Durations

Milestones (Zero time and resource tasks that mark completion events)

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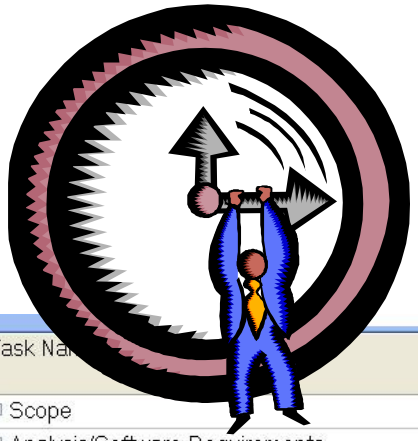
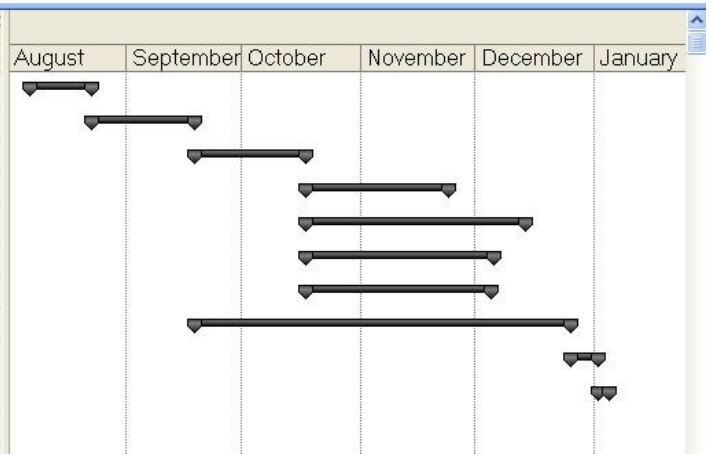
baseline and monitor actual



Baseline the Task Durations

	Task Na	Baseline Duration	Duration	Start	Finish	F
1	Scope	36 hrs?	96 hrs	8/7/2007	8/22/2007	
7	Analysis/Software Requirements	120 hrs?	152 hrs	8/23/2007	9/18/2007	
17	Design	116 hrs?	168 hrs	9/19/2007	10/17/2007	
25	Development	174 hrs?	216 hrs	10/18/2007	11/23/2007	
32	Testing	390 hrs?	328 hrs	10/18/2007	12/13/2007	
48	Training	366 hrs?	280 hrs	10/18/2007	12/5/2007	
57	Documentation	244 hrs?	272 hrs	10/18/2007	12/4/2007	
67	Verification Test	562 hrs?	560 hrs	9/19/2007	12/25/2007	
73	Deployment	40 hrs?	40 hrs	12/26/2007	1/1/2008	
80	Post Implementation Review	24 hrs?	24 hrs	1/2/2008	1/4/2008	



Record the actual time (Performer's logs)

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Project file to Minitab® via Excel

- Save the Project file as an Excel workbook[1]
- Export the Duration, Baseline Duration, and Finish Date[2]
- Strip out summary tasks and milestones[3]
- Fire up Minitab and read the Excel file

Notes:

1. Will put you into the export wizard
2. Time units need to be the same
3. Milestones are usually zero time and resources tasks that mark a completion

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ne Plan error of each task

- Error = 100 × (Duration - Baseline_ Duration) ÷ Baseline_Duration

Task_Table1 ***

	C1	C2-T	C3	C4-T	C5-D	C6-D	C7	C8	C9	C10-T
	Duration		Baseline_Duration		Start_Date	Finish_Date		Error		Finish
1	1	day	4	hrs?	8/7/2007	08/2007		-75.000		08/2007
2	1	wk	1	day?	8/8/2007	08/2007		0.000		08/2007
3	1	day	1	day?	8/15/2007	08/2007		0.000		08/2007
4	1	wk	2	days?	8/16/2007	08/2007		-50.000		08/2007
5	5	days	6	days?	8/23/2007	08/2007		-16.667		08/2007
6	1	day	3	days?	8/30/2007	08/2007		-66.667		08/2007
7	1	wk	2	days?	8/31/2007	09/2007		-50.000		09/2007
8	1	day	4	hrs?	9/7/2007	09/2007		-75.000		09/2007
			1	day?	9/10/2007	09/2007		100.000		09/2007
			1	day?	9/12/2007	09/2007		0.000		09/2007
			4	hrs?	9/13/2007	09/2007		-75.000		09/2007
			1	day?	9/14/2007	09/2007		200.000		09/2007
			2	days?	9/19/2007	09/2007		150.000		09/2007
			5	days?	9/26/2007	10/2007		0.000		10/2007
			4	days?	10/3/2007	10/2007		25.000		10/2007
			2	days?	10/10/2007	10/2007		-50.000		10/2007

Alternatively could do this with ±Days early or late

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n Xbar Chart in Minitab

- Sort the data by finish date
- Unstack and transpose data so they are in columns by month
- Select the common tests for special causes
- Interpret the results

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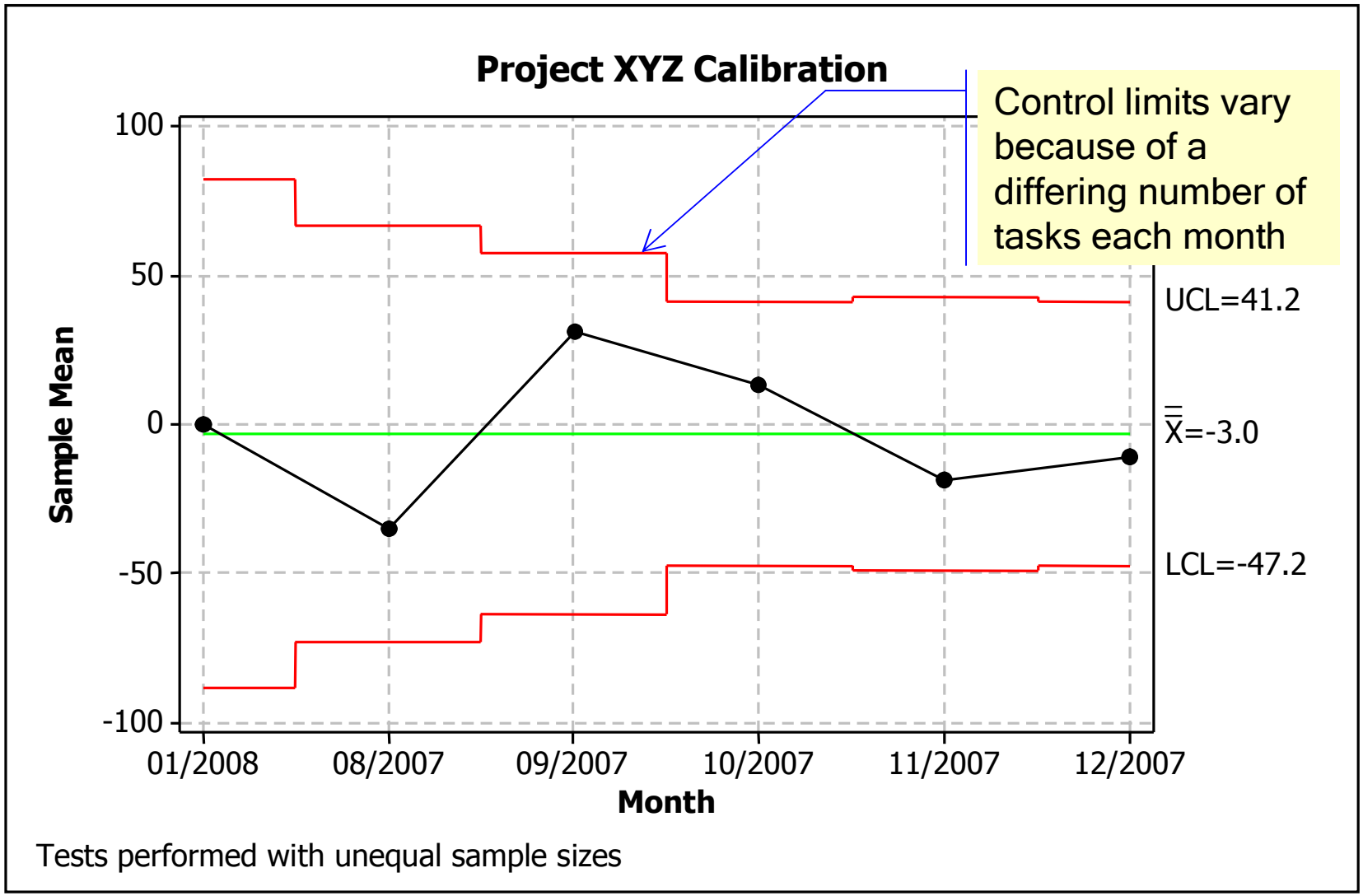
chart shows that the overall ut 3%



Tests performed with unequal sample sizes

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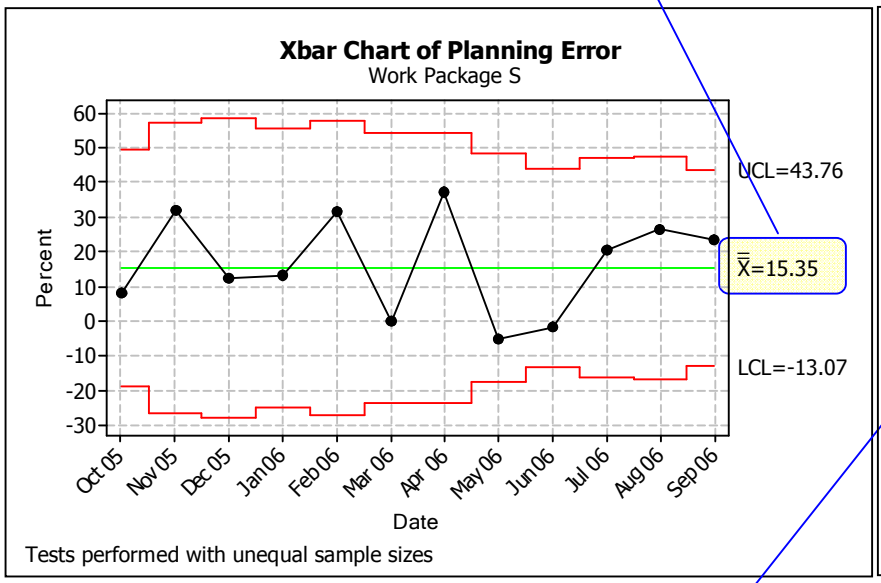
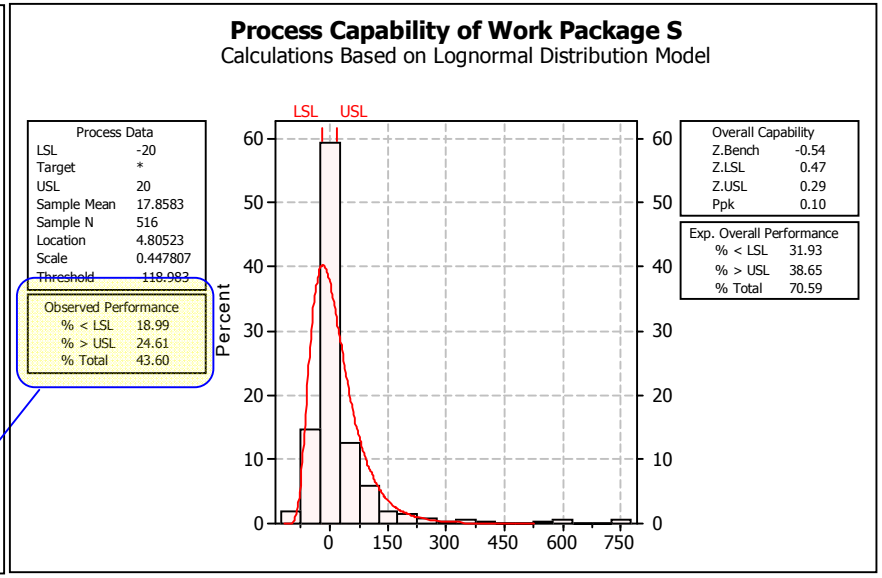
le from a real project

Systematic 15% underestimate of duration





Within the ±20% error range 56% of the time

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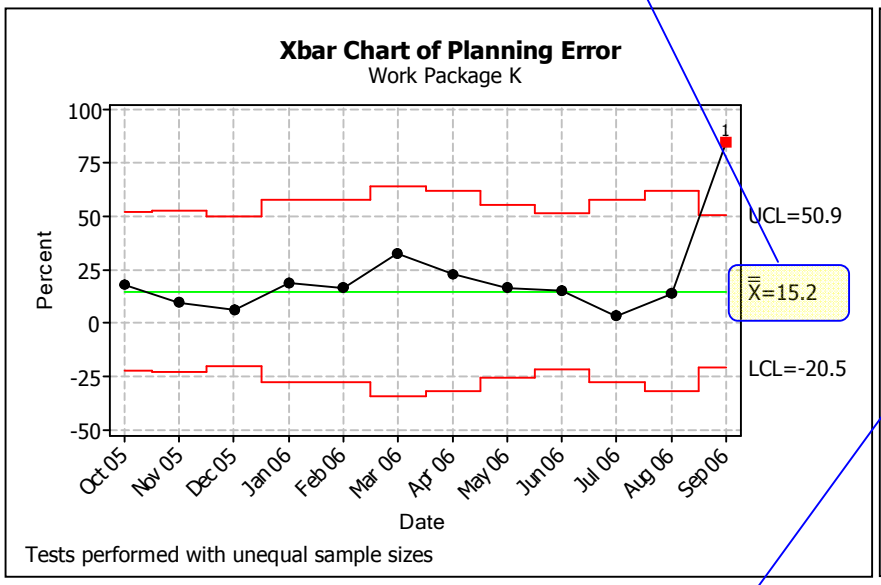
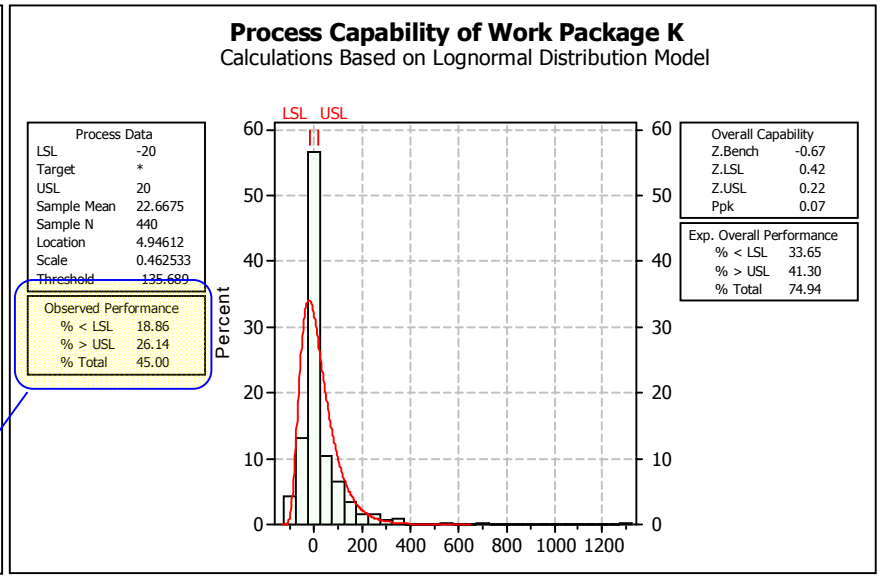
Systematic 15% underestimate of duration





Within the ±20% error range 55% of the time

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Parkinson's Law

"WORK EXPANDS TO FILL THE TIME AVAILABLE"

Cyril Northcote Parkinson (1909-1993)

Naval historian and author of some sixty books, the most famous of which was his best seller Parkinson's Law, which led him to be also considered as an important scholar within the field of public administration.

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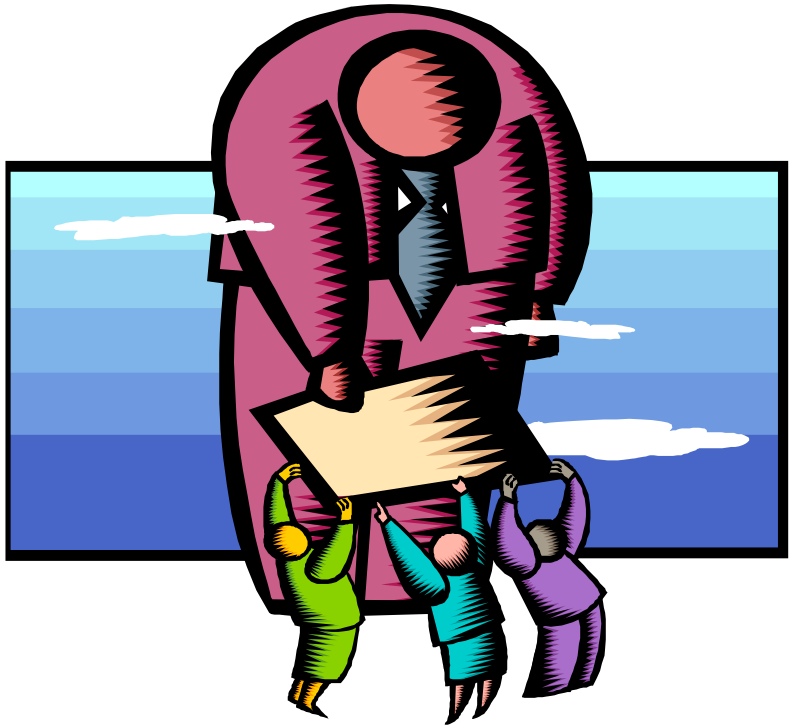

- Calibrating your projects can improve due-date performance
- Source data already is available in many projects; don't need to collect new data
- Can compare differences among WBS's, workgroups, or functional groups to determine inherent planning error

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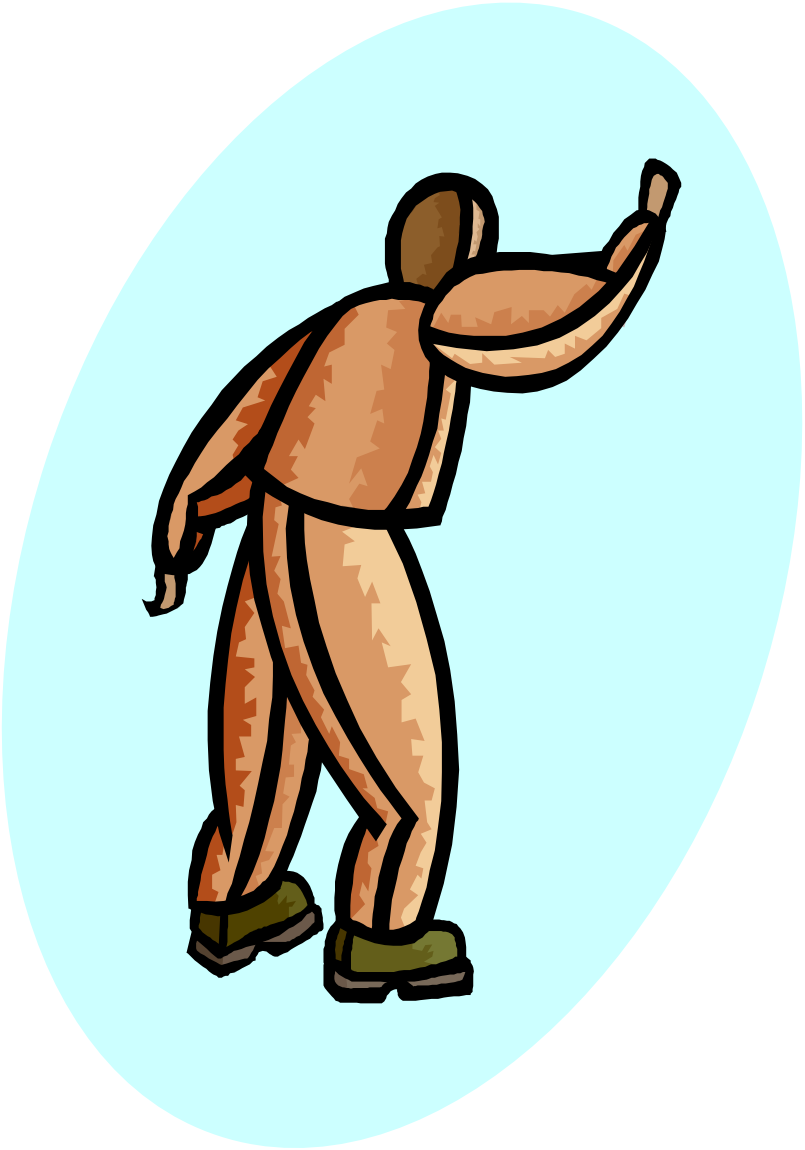

Questions?

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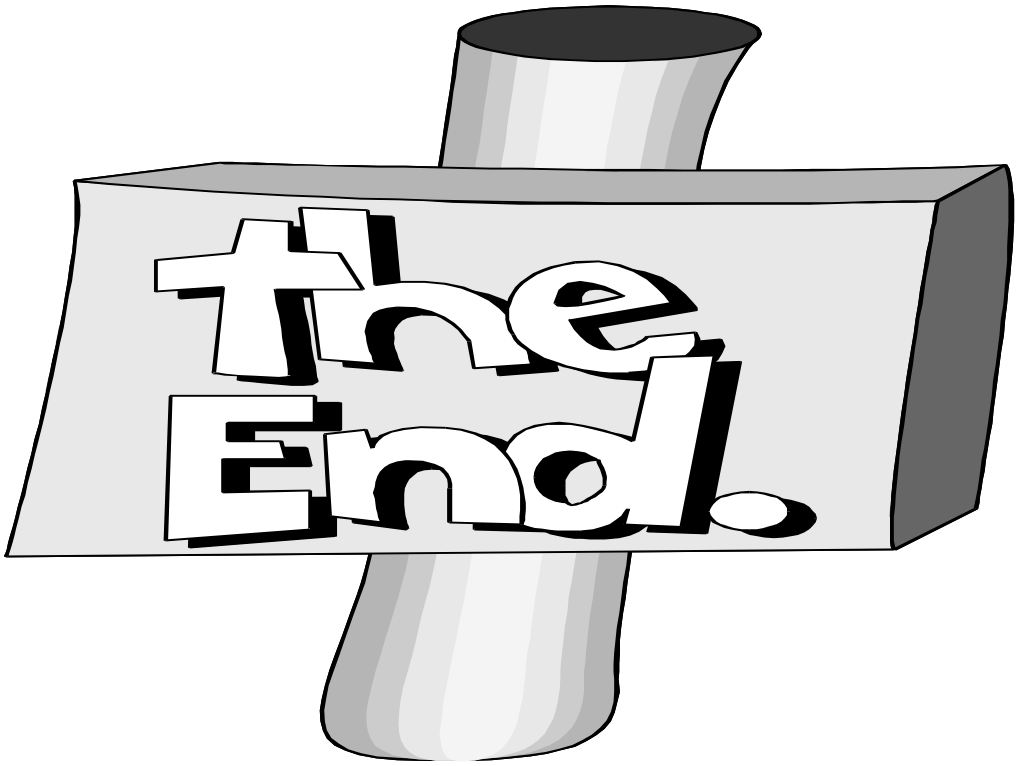

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