

Project Management

Topic 4.5

Schedule Development with Leveling



FULCRUM *EDGE*, INC.

Schedule Development

- Involves applying analysis techniques to the network created from the activities, dependencies, resources and durations
- Adjustments are made in an iterative fashion to achieve acceptable project dates
- This revision process continues throughout the project to maintain a realistic schedule

Schedule Analysis Techniques

- Critical Path – As Soon As Possible (see Topic 5.2)
- Critical Chain – As Late As Possible
- Resource Leveling (Smoothing and leveling)
- What-if Scenarios
- Schedule Compression
 - Crashing – cost time trade offs
 - Fast Tracking – sequenced items in parallel

Resource Scheduling

- Nearly all projects have limits on resources
- Project delays often occur due to lack of resource availability
- **Resource Smoothing** – Applies resources as uniformly as possible (minimum fluctuation) without extending the project schedule
- **Resource Leveling** – Stays within the resource limits even if it is necessary to extend the project completion time

4.5.1 Class Exercise



Resource Smoothing/Leveling

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Resource-Smoothed Schedule



Task	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6
A	2	2	2			
B			3	3	3	
C				4	4	4
D		1	1	1		
E		1	1	1	1	1
Total	2	4	7	9	8	5
Smooth						
Task	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6
A						
B						
C						
D						
E						
Total						



Raise Projector Screen

Resource-Levelled Schedule



Task	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	
A	2	2	2						
B			3	3	3				
C				4	4	4			
D		1	1	1					
E		1	1	1	1	1			
Total	2	4	7	9	8	5			
Level @ 4 Workers									
Task	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8	Wk9
A									
B									
C									
D									
E									
Total									



Raise Projector Screen

4.5.2 Team Exercise



Kitchen Project Leveling

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Schedule Formats

- Milestone chart
 - Lists project deliverables and interface dates
 - Shows all dates deemed critical by the project team
- Gantt chart
 - Time scale relates activities to time
- Network chart
 - Dependency logic without timescale

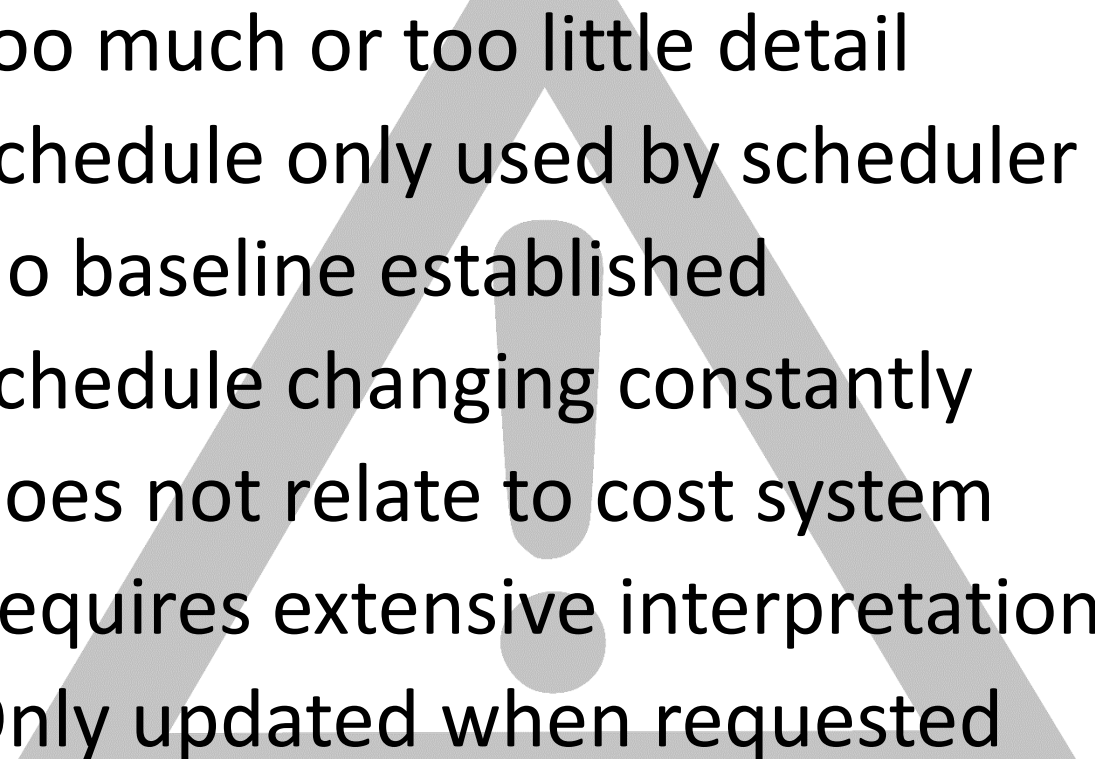
Schedule Format Usage

- **Milestone chart** - Leadership
 - Early planning and high level reviews
- **Gantt chart** – All work teams
 - Most commonly used chart detailing all phases
 - What if Scenarios and Schedule issue resolution
- **Network chart** - Install teams
 - Useful for erection sequence & dependencies

Schedule Creation Summary

- Define project objective
- Define project phases
- Develop WBS
- Identify network and dependencies
- Estimate resources and duration
- Define milestone and interface events
- Develop schedule

Schedule Pitfalls

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- ✓ Too much or too little detail
 - ✓ Schedule only used by scheduler
 - ✓ No baseline established
 - ✓ Schedule changing constantly
 - ✓ Does not relate to cost system
 - ✓ Requires extensive interpretation
 - ✓ Only updated when requested