Info6007 Project Management in IT

Week 3 - First Time

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"The sooner you get behind schedule, the more time you have to make it up"



Lecture Resources

- Practice Questions
 - Schwalbe 7e/8e:
 - Ch 6: Discussion Questions: 4, 5, 6 (except CCS and Sprints)
 - Ch 6:Exercises: 2 and 3.
- Required Readings
 - Schwalbe 7e/8e: Chapter 6
- References
 - Schwalbe, K. 2015, Information Technology Project Management (8e) Cengage Learning
 - Schwalbe, K. 2012, An Introduction to Project Management (Fourth Edition)

Learning Objectives

- Describe the importance of project schedules and good project time management
- Discuss and apply the key schedule management processes
- Use network diagrams and dependencies to perform activity sequencing
- Explain various tools and techniques that help project managers perform activity duration estimates
- Calculate Earliest Start and Finish times and Latest Start and Finish times and Total and Free Slack times
- Create and use a Gantt chart for planning and tracking schedule information, and find the critical path for a project

Agenda - Time

- Time Management Processes Overview
- Sequencing
 - Milestones
 - Dependencies
 - Network Diagrams: AON, AOA
- Estimating
 - Getting Estimates
 - Elapsed vs Effort
- Scheduling
 - Gantt Charts
 - Critical Path
- Calculating Slack
- Advice
- Tutorial

Time Management Processes

- Key PMBOK Time Management Processes:
 - Planning schedule management: determining the policies, procedures, and documentation that will be used for planning, executing, and controlling the project schedule
 - Defining activities: identifying the specific activities that the project team members and stakeholders must perform to produce the project deliverables
 - Sequencing activities: identifying and documenting the relationships between project activities
 - Estimating activity resources: estimating how many resources a project team should use to perform project activities
 - Estimating activity durations: estimating the number of work periods that are needed to complete individual activities
 - Developing the schedule: analyzing activity sequences, activity resource estimates, and activity duration estimates to create the project schedule
 - Controlling the schedule: controlling and managing changes to the project schedule

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Sequencing - Milestones

- Milestones are used to identify and track significant points or achievements in the project
 - For example: A significant event, completion of a phase, customer sign-off on key documents, completion of specific products.
- It often takes several activities and a lot of work to complete a milestone.
- People like to focus on meeting milestones, especially for large projects
- Typically milestone are created by entering tasks with a zero duration; however you can mark any task as a milestone

Sequencing - Dependencies

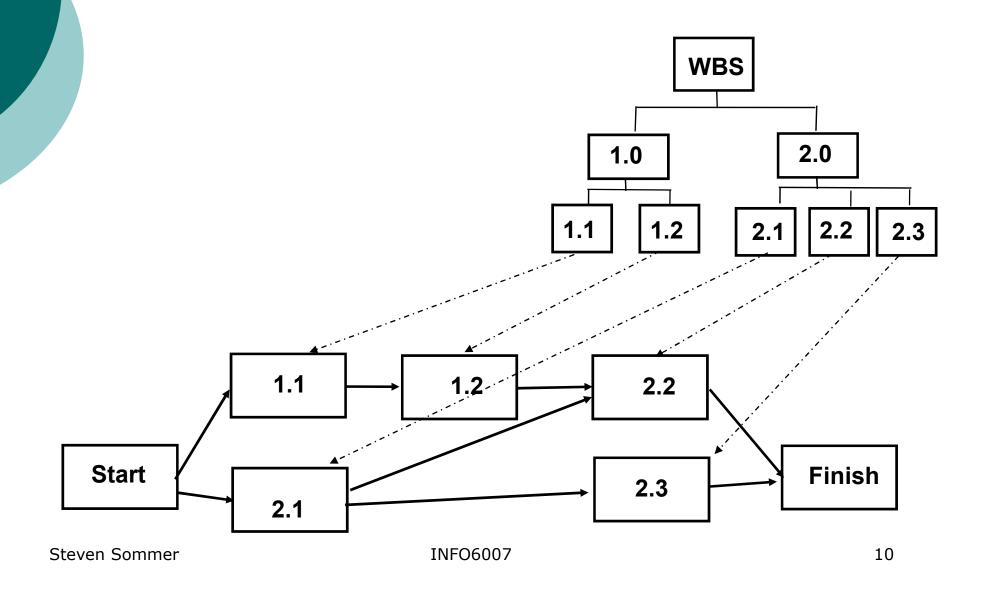
- Each item of the WBS may have dependencies on other things happening before the item can start or complete.
- There are three types of dependency
 - Mandatory dependencies:
 - Inherent in the nature of the work; hard logic
 - E.g.:, write code before test
 - Discretionary dependencies:
 - Defined by the project team; soft logic
 - E.g.:, User training should not begin before testing is signed off
 - External dependencies:
 - Involve relationships between project and nonproject activities
 - E.g., Waiting on equipment delivery

Sequencing - Network Diagrams

 Project network diagrams are a technique for showing activity sequencing

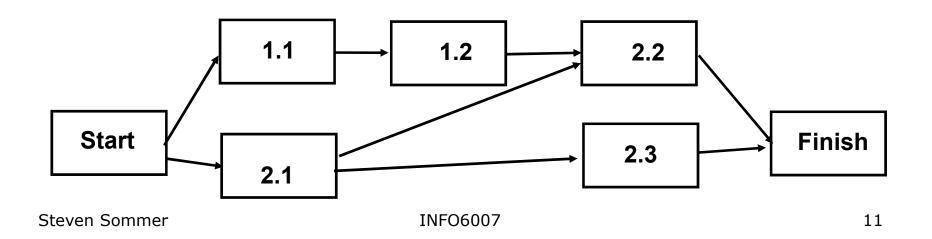
- o Two main types:
 - Precedence Diagramming Method
 - Also known as activity on node (AON)
 - Arrow Diagramming Method
 - Also known as activity on arrow (AOA)

WBS to Network Diagram (AON)

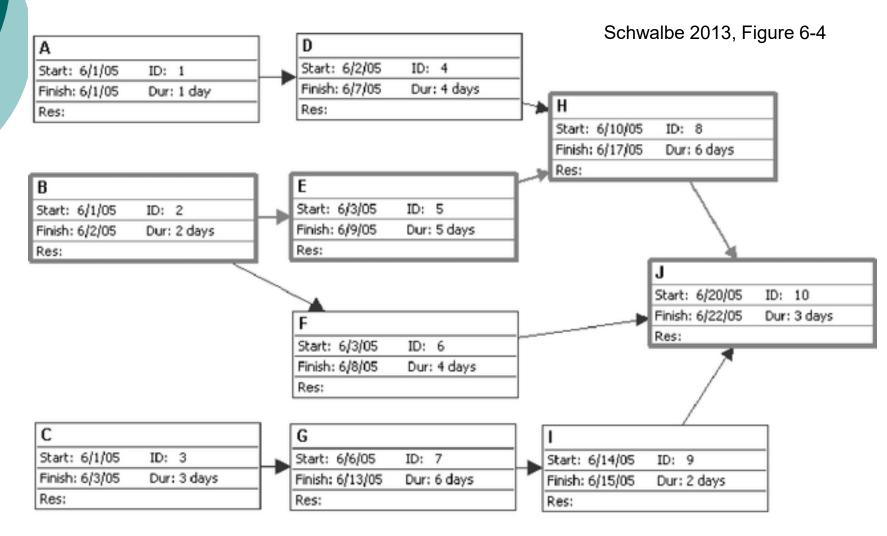


Precedence Diagramming Method (or AON)

- Activities are represented by boxes
- Arrows show relationships between activities
- There are predecessors and successors for ALL activities.



Sample PDM Network Diagram (MS Project)



AON/MS Project allows 4 Types of dependency

Task dependency	Example	Description
Finish-to-start (FS)	A B	Task (B) cannot start until task (A) finishes.
Start-to-start (SS)	A B	Task (B) cannot start until task (A) starts.
Finish-to-finish (FF)	A B	Task (B) cannot finish until task (A) finishes.
Start-to-finish (SF)	A	Task (B) cannot finish until task (A)
	B ◆	starts. Schwalbe 2013, Figure 6-3

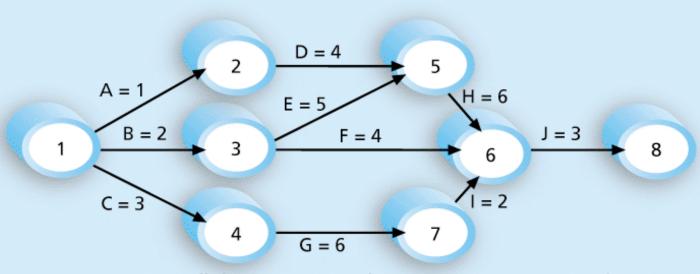
MS Project also allows external dependencies. Examples:

- FS: "Contact Caterers" after "Determine Menu Requirements"
- SS: Training classes run in parallel that must start together
- FF: Quality Control over Production. One cannot finish before the other.
- SF: (Rare) JIT goods arriving before manufacturing or babysitter finishing when parents arrive home

Arrow Diagramming Method (or AOA)

- Activities are represented by arrows
- Nodes or circles are the starting and ending points of activities
- Can only show finish-to-start dependencies

Sample Activity-on-Arrow (AOA) Network Diagram



Note: Assume all durations are in days; A=1 means Activity A has a duration of 1 day.

Schwalbe 2013, Figure 6-2

Network diagrams - In practice

- Are rarely used by project managers
 - They get too complex too quickly
- Those that are used are usually generated from project management tools (E.g. MS Project)
- Gantt charts are used for time management and presentations (covered soon)

Wedding Exercise

 In your groups, draw a network diagram for the wedding you designed last week. You will need to agree on all the dependencies. Include milestones

o Time: 30 mins

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 - **b)** Elapsed vs Effort
- 4. Scheduling
 - a) Gantt Charts
 - b) Critical Path
- 5. Calculating Slack
- 6. Advice



"Every project can be estimated accurately, once it is finished"

"To estimate a project, work out how long it would take one person to do it then multiply that by the number of people on the project."

Quiz

O How did we measure the piece of string?

Secrets to Estimation

- Expert needs to estimate
 - Preferably the person doing the work
- Experts are typically poor at estimation
 - Keep breaking down the tasks
- Estimates should be reviewed to ensure all subtasks are considered – not to negotiate on time.
- Learn people's ability to estimate
 - Adjust for it
 - Implement process to improve estimation
- Estimation often depends on the assigned resource
 - This is almost always ignored
- Some estimating tools exist more when we do cost estimation.

Program Evaluation and Review Technique (PERT)

- PERT is a network analysis technique used to estimate project duration when there is a high degree of uncertainty about the individual activity duration estimates
- PERT uses probabilistic time estimates
 - duration estimates based on using optimistic, most likely, and pessimistic estimates of activity durations, or a three-point estimate

PERT weighted average =

(optimistic time) + 4 x (most likely time) + (pessimistic time)

PERT Exercise

- Calculate the PERT weighted average time when
 - optimistic time= 8 days
 - most likely time = 10 days, and
 - pessimistic time = 24 days?
- What estimate would you then use on the network diagram?

Duration vs. Work

- Duration / Elapsed time
 - time between start and end of task
- Work / Effort
 - amount of time that is actually dedicated to completing the task

Quiz: What is the elapsed time & effort for a person attending a 1 hour weekly meeting for the 10 weeks of a project?

Wedding Exercise 2

- In groups, complete your network diagram by adding time estimates to all the tasks.
- o Time: 15 mins

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"The first 90% of a project takes 90% of the time;

the last 10% takes the other 90%."

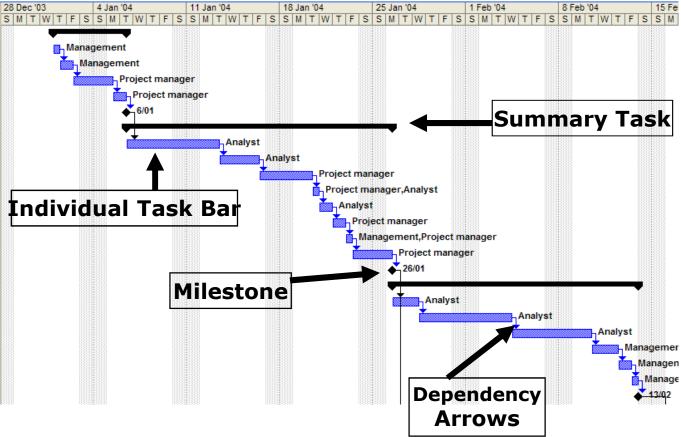
Schedule Development

- Goal is to create a realistic and achievable schedule as a basis for monitoring the time dimension of project progress
- Determines start & finish time for project
- Most common tools
 - Gantt charts
 - CPM (Critical Path Method)

Gantt Chart



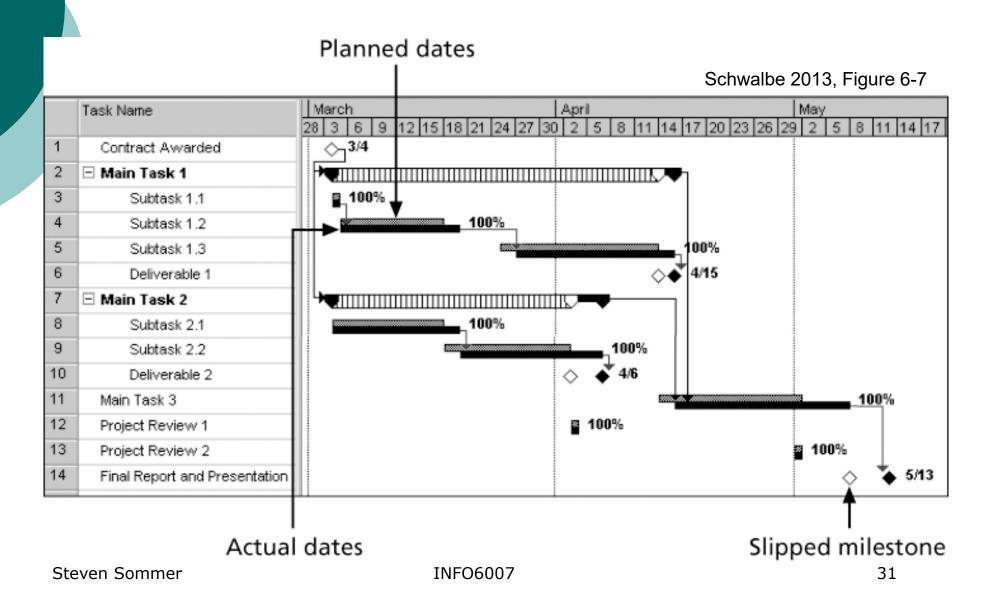




Schedule Tracking

- When the project starts, a baseline of the project schedule is created
- Any successive changes to the schedule (eg., as tasks complete earlier or later than expected) are reported against the baseline
- A tracking Gannt chart can be used to show these.

Sample Tracking Gantt Chart



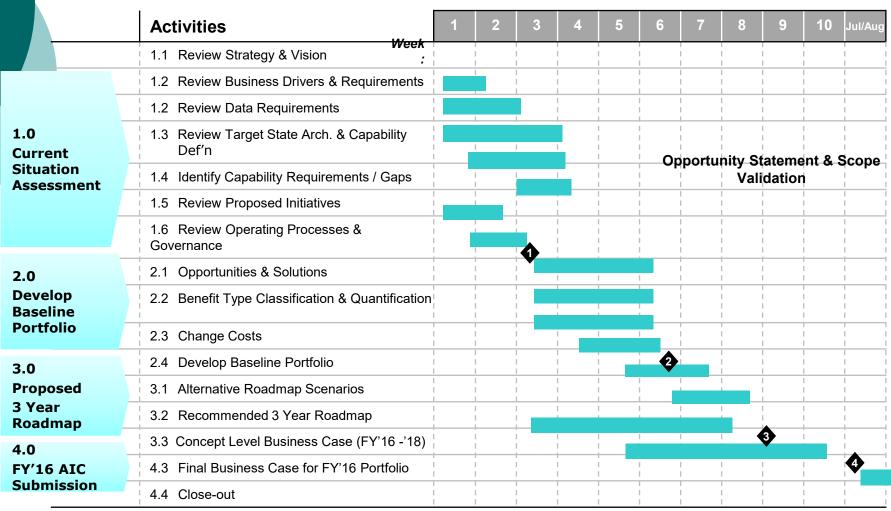
Tentative Timelines



Phase	Tasks
Preparatory Phase (Wk 0)	 Resource Ramp-up Identifying and allocating individual responsibilities from Satyam & Sony Teams
Scoping Phase (Wk 1 - Wk 2)	 Kick-off meeting with the key customer team Detailed level planning for the study Customize the standard questionnaire Conduct first round of high level interviews Define scope & update project plan Obtain Scope Sign-off
As-Is Study (Wk 3 - Wk 5)	 Conduct interviews Study and understand the present system Elicit and analyze customer expectations

Phase	Tasks
Analysis (Wk 6 - Wk 7)	 Prepare Gap Analysis Report Perform benchmarking analysis Prioritize recommendations Prepare implementation roadmap Perform High level Cost/Benefit Analysis Prepare comprehensive study report outlining findings, analysis & recommendations
Recommenda tions (Wk 8)	Share Recommendations with Key stakeholdersObtain approval for Deliverables

Roadmap – Work plan





Project Sponsor Project Sponsor



Agreement on Preferred 3 Year Roadmap

Agreement on FY16 Business Case &

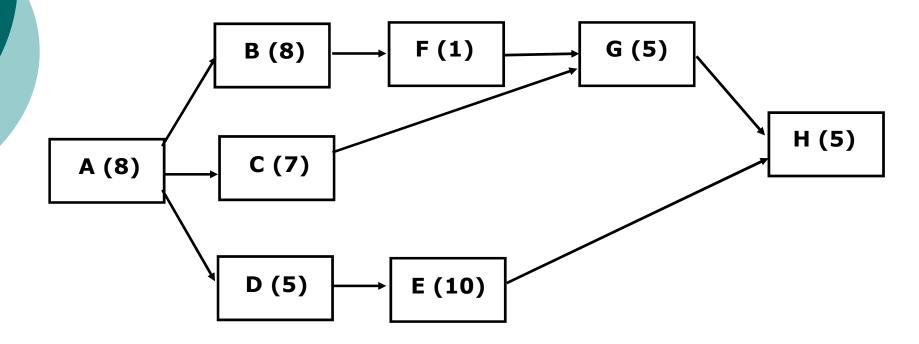
7 AIC Submission

Comple

Critical Path

- A critical path for a project is the series of activities that determines the earliest time by which the project can be completed
- To find the critical path:
 - Add the durations for all activities on each possible path to completion
 - The longest path is the critical path
- ✓ Longest path start to finish
- Determines the Shortest project timeframe

Critical Path



- o How many paths are there ?
- Which is the critical path?
- o How long will it take to complete the project?

Critical Path: Correcting misconceptions

- The critical path is NOT the one with all the "critical" activities: it only accounts for time
 - Growing grass was on the critical path for Disney's Animal Kingdom
- There can be more than one critical path if the lengths of two or more paths are the same length
- The critical path CAN change as the project progresses

Agenda - Time

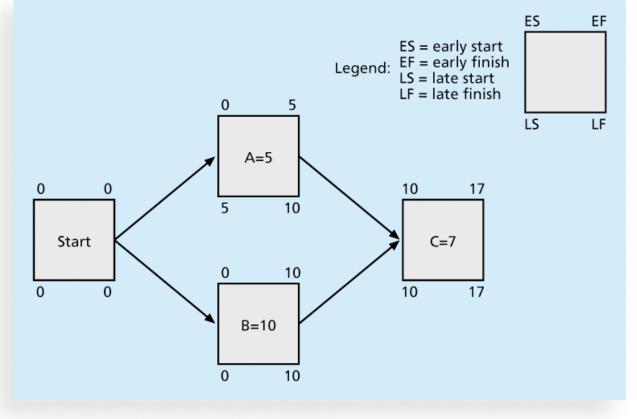
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Calculating Slack

- Free slack or free float is the amount of time an activity can be delayed without delaying the early start of any immediately following activities
- Total slack or total float is the amount of time an activity may be delayed from its early start without delaying the planned project finish date
- Start by determining:
 - Early Start (ES)
 - Earliest date an activity/task can begin
 - Early Finish (EF)
 - Earliest date an activity/task can complete
 - Late Start (LS)
 - Latest date an activity/task can begin without delaying a successor activity/task
 - Late Finish (LF)
 - Latest date a task can complete without delaying a successor task

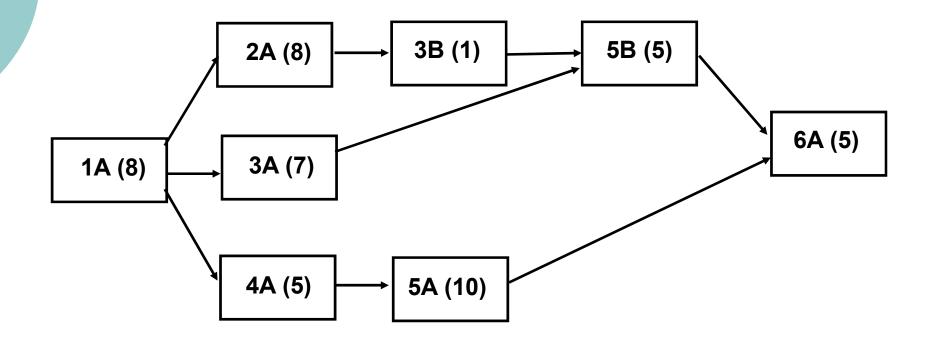
Calculating Early and Late Start and Finish Times

- A forward pass through the network diagram determines the early start and finish dates
- A backward pass determines the late start and finish dates



Schwalbe 2013, Figure 6-9

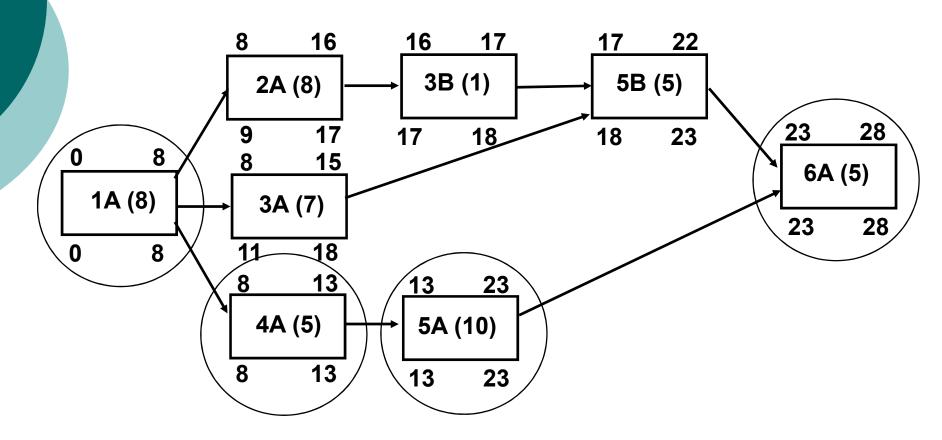
Ex: Calculate ES, EF, LS, LF



Calculating Slack/Float

- Free Float or Slack
 - Amount of time an activity/task can be delayed without delaying the Early start of its successor activity/task
 - Free float = ES (successor) EF (self)
- Total Float or Slack
 - Amount of time that any activity/task may be delayed from its early start without delaying the project finish date
 - Total Float = LS ES (or LF EF)
 - If float is
 - >0 time is available (therefore not on critical path)
 - o = 0 on critical path

Calculating Slack

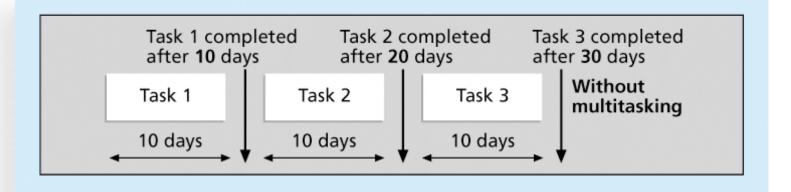


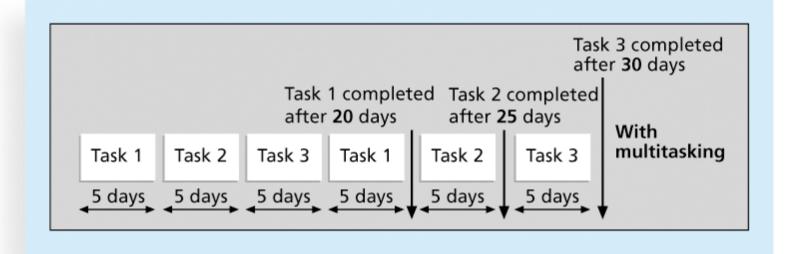
Critical path = 1A, 4A, 5A, 6A Project length = 28 days What is the free float for 3A? The total float for 3A?

Steve's advice

- Different schedules for different stakeholders
 - At least 3 yours, upwards, downwards
 - Hidden buffers
- Always get estimates from expert (ideally the guy doing the work)
 - Have them try to achieve their estimate
 - Increase their estimate in your own schedule
- Buffer, Buffer, Buffer
 - Not the tasks themselves but everything else
 - Lots of hidden Buffer Tasks
 - Buffer resource availability (max 80%)
 - Lower if team-lead etc
 - Extra Tasks
 - Training, Setup, Hiring, Coming up to speed
 - Xmas, Easter Leave
- Only 4 day weeks then use as buffer
 - Leave, Training, Sick, Public Holidays, ...
- Double any ad-hoc estimate, often twice.

Multitasking is Bad!





Schwalbe 2013, Figure 6-10

Summary

- 1. Planning Schedule Management
- 2. Sequencing
 - a) Milestones
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