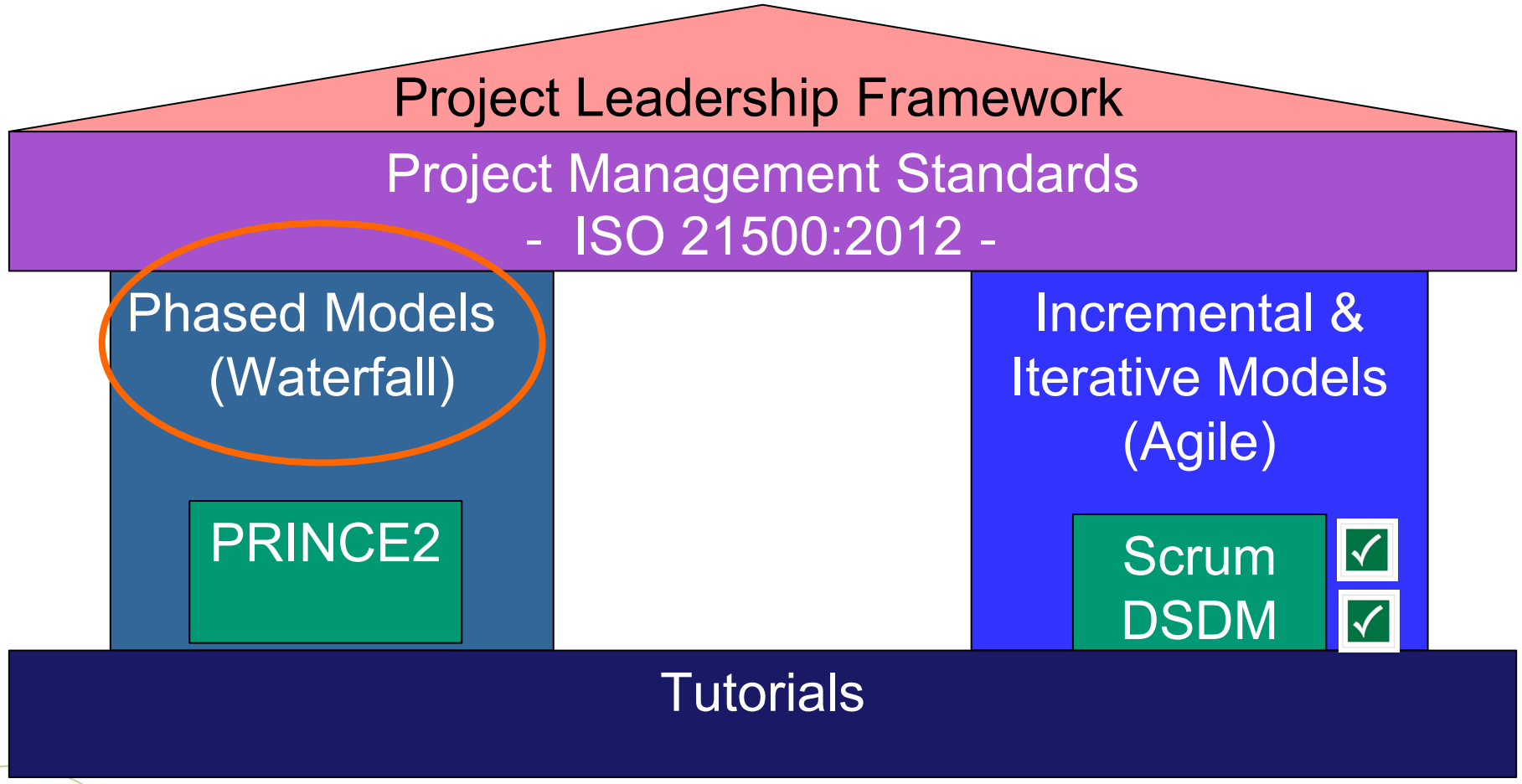
PRINCE2 and Project Management Skills

Timebox 10 of 12

Lecturer: Sri Nair

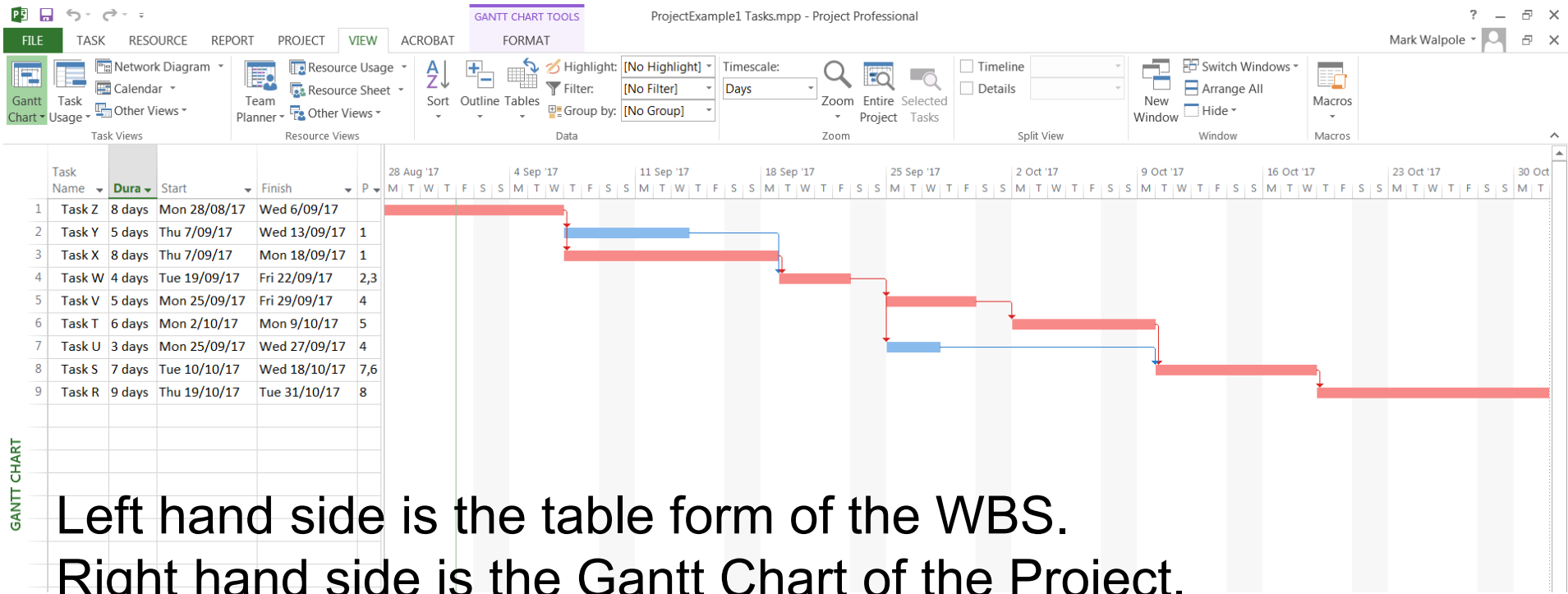
Unit Themes



Scheduling with Gantt Charts

Establish a timeline.

MS Project



Left hand side is the table form of the WBS.

Right hand side is the Gantt Chart of the Project.

(Critical Path (CP) tasks in red, Non-critical path tasks in blue).

Gantt Charts

Benefits

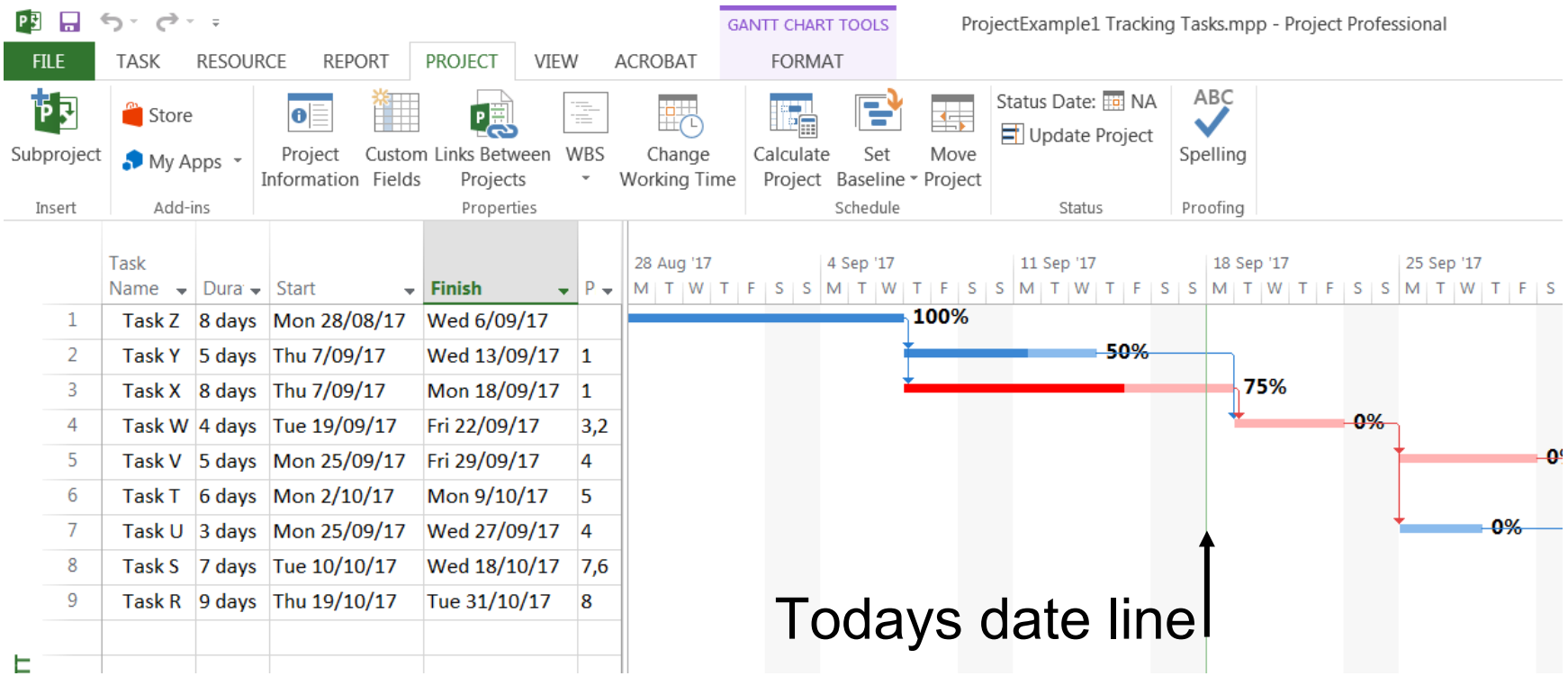
1. Easy to create and comprehend
2. Identify the schedule baseline
3. Allow for updating and control
4. Identify resource needs (discussed shortly)

Types of Gantt Charts include;
Tracking, Milestones, Summary or Detailed.

Tracking Gantt Charts

Used to evaluate project performance at specific time.

- Easy to identify tasks on or behind schedule.
- Displayed as % complete and bolded horizontal bar.



Tracking Gantt Charts

Disadvantages:

- Only accurate when updated.
- Difficult to accurately estimate the time to completion especially if significant positive or negative variations have occurred.
- If behind schedule does not show the source of problems.

Tracking Gantt charts should be used with other more prescriptive techniques.

Resources and Constraints

Resources - anything needed to complete the activities.

- Estimate and allocate to each WBS work package.
- Types of resources: Capital or human.

Capital resources include;

- Money
- Materials
- Equipment
- Facilities (E.g.. Work environment)
- Others

Resources and Constraints

Human resources - E.g.. For an IS project include;

- System Analysts
- Programmers
- Database developers
- Web developers
- Others…

Human resources selection considerations:

Skill level, Experience, Interest, Cost, Location of work, and Availability.

Project Costing

Best quality assurance method - establish a benchmark against which the key cost items may be measured for realism. (Primarily labour in an IT project)

Delphi technique.

This relies on obtaining group input for ideas and problem solving without requiring face-to-face participation. It uses a series of questionnaires interspersed with information summaries and feedback from preceding responses to achieve an estimate.

Bottom-up estimating.

Each individual piece of work is estimated on its own merit. These are then summed together to find the estimated efforts for the various summary level activities and overall plan

Parametric estimating.

Basing estimates on measured/empirical data where possible (for example, estimating models exist in the construction industry that predict materials, effort and duration based on the specification of a building)

Project Costing

Single-point estimating.

The use of sample data to calculate a single value which is to serve as a 'best guess' for the duration of an activity

Comparative estimating.

Much data exist about the effort required and the duration of particular items of work. Overtime an organization may build up its own historical data regarding projects that it has undertaken (previous experience or lessons learned).

Top-down estimating.

Once a good overall estimate has been arrived at for the plan (by whatever means), it can be subdivided through the levels of the product breakdown structure.

Three-point estimating.

Ask appropriately skilled resources for their best-case, most likely and worst-case estimates. The value that the Project Manager should choose is the weighted average of these three estimates

Top-down and bottom-up approach.

An overall estimate is calculated for the plan. Individual estimates are then calculated, or drawn from previous plans, to represent the relative weights of the tasks.

Project Costing Caveat

"IT Project Cost Estimating is a more Black Art than Science"

Planning fallacy

"due to cognitive biases people systematically underestimate the costs, completion times, and risks of planned actions, whereas we overestimate the benefits of the same actions." (Flyvbjerg , 2016 p.1)

Trust me!

"has historically not been the best basis for handing over large sums of money to strangers to invest" (Flyvbjerg , 2016 p.7)

Epilogue: Sue the forecaster

In 2015, AECOM Technology Corp. settled a major lawsuit over forecasts they made for the Clem7 toll road in Brisbane, Australia. AECOM was paid just a few million dollars in fees for the forecasts, but when Clem7 went bankrupt AECOM was held accountable, because their forecasts proved vastly overestimated, resulting in steep revenue shortfalls. AECOM settled the case by paying $280 million Australian dollars to creditors. (Flyvbjerg , 2016 p.15)

Resources and Constraints

Project constraints

- Project constraints are anything that restricts or dictates the actions of the project team.

Project constraints include cost, time, scope, quality, resource and risk. Cost, time and scope are referred to as the triple constraint. Fast, cheap or good – you can have any two.

PRINCE2 refers to constraints as tolerances. Acceptable ranges are defined and monitored to identify when a plan has entered “problematic” or “exception” territory. Tolerances are used at all three planning levels of a project.

Resources and Constraints

The availability of a resource always has a direct bearing on the duration of an activity.

Resource loading:

- amount of individual resources an existing schedule requires during specific time periods.

Over-allocation:

- more resources have been assigned than are available to perform the work at a given time.

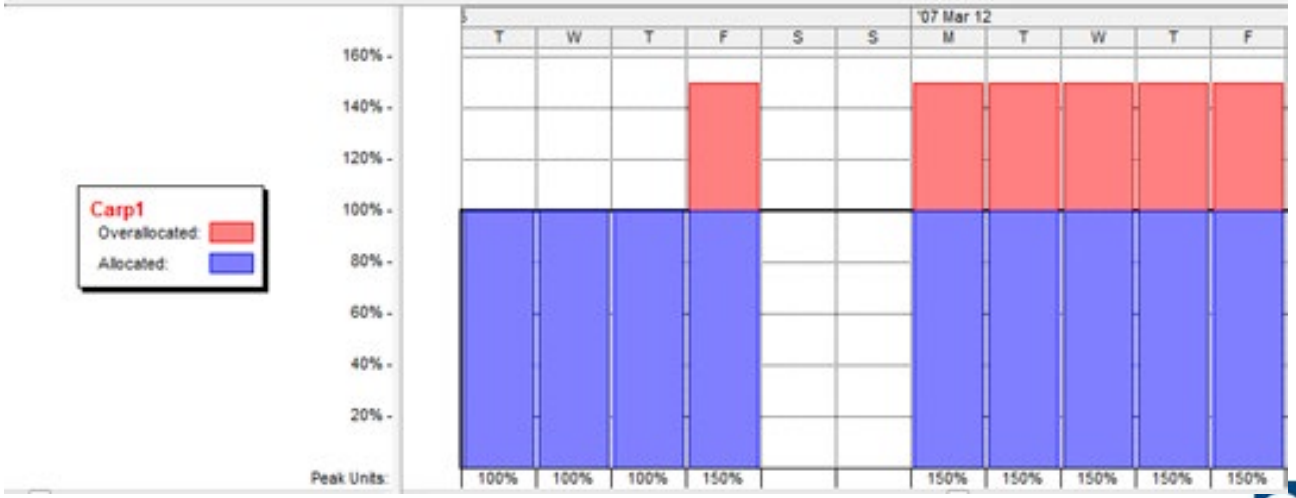
Resources and Constraints

Example:

Resource Usage Table

Resource Chart

		Resource Name	Work	Details	'07 Mar 12 T	W	T	F	S	S	M	T	W	T	F
1		Manager	0 hrs	Work											
2		Carp1	136 hrs	Work	8h	8h	8h	12h			12h	12h	12h	12h	12h
		Raise walls	32 hrs	Work	8h	8h	8h								
		Install roof	48 hrs	Work				8h			8h	8h	8h	8h	8h
		Lay tiles	56 hrs	Work				4h			4h	4h	4h	4h	4h
3		Carp 2	172 hrs	Work	8h	8h	8h	16h			16h	8h	16h	16h	16h
		Lay foundation	40 hrs	Work											
		Raise walls	32 hrs	Work	8h	8h	8h								
		Install roof	44 hrs	Work				8h			8h	4h	8h	8h	8h
		Lay tiles	56 hrs	Work				8h			8h	4h	8h	8h	8h
4		Carp 3	88 hrs	Work	8h	8h	8h	8h			8h	8h	8h	8h	8h
		Raise walls	32 hrs	Work	8h	8h	8h								
		Lay tiles	56 hrs	Work				8h			8h	8h	8h	8h	8h
				Work											
				Work											
				Work											



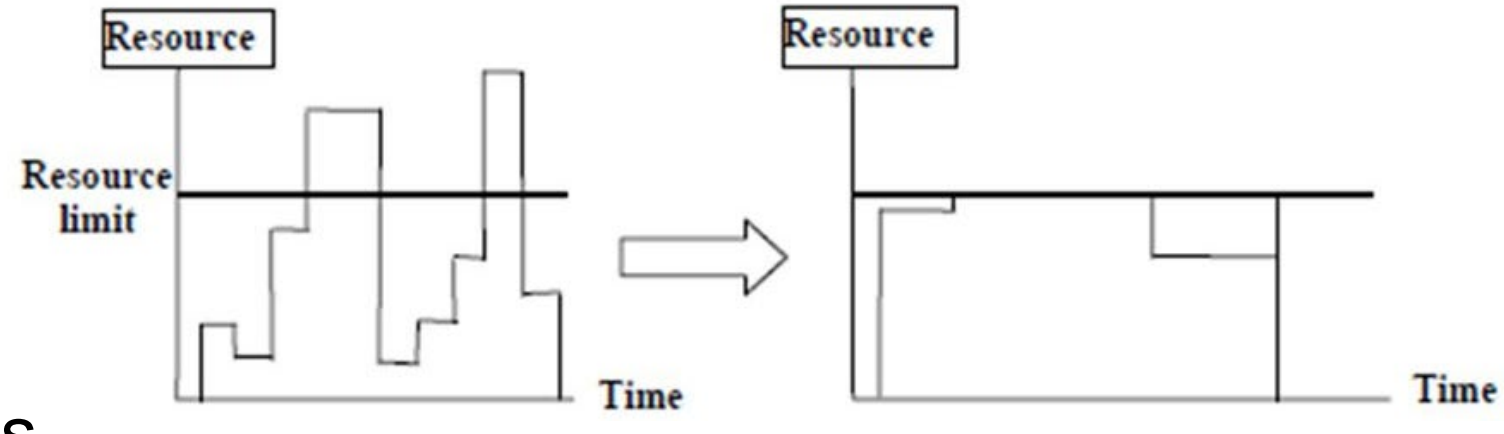
Resource Levelling

A technique for resolving resource conflicts by delaying tasks, creating a smoother distribution of resource usage and reduce over-allocation.

Objectives

- Determine the resource requirements so that they will be available at the right time.
- Allow each activity to be scheduled with the smoothest possible transition across resource usage levels.

Resource Levelling



Benefits

More constant, uniform and consistent use of resources:

- requires less management.
- enables just-in-time inventory policy for expensive resources.
- results in fewer problems for project personnel and accounting department.
- improves morale.

Resource Levelling

Project scheduling including resource usage:

1. Initial network diagram to identify critical path.
2. Identify and allocate resources.
   Use the WBS table including; resources, ES and LF.
3. Develop a resource loading chart.
   Initially schedule all tasks from ES.
4. Identify over allocated or peak resource issues.
5. Level the resource loading chart.
   Use the resource levelling heuristic.

Example: Project with 6 tasks (U to Z)

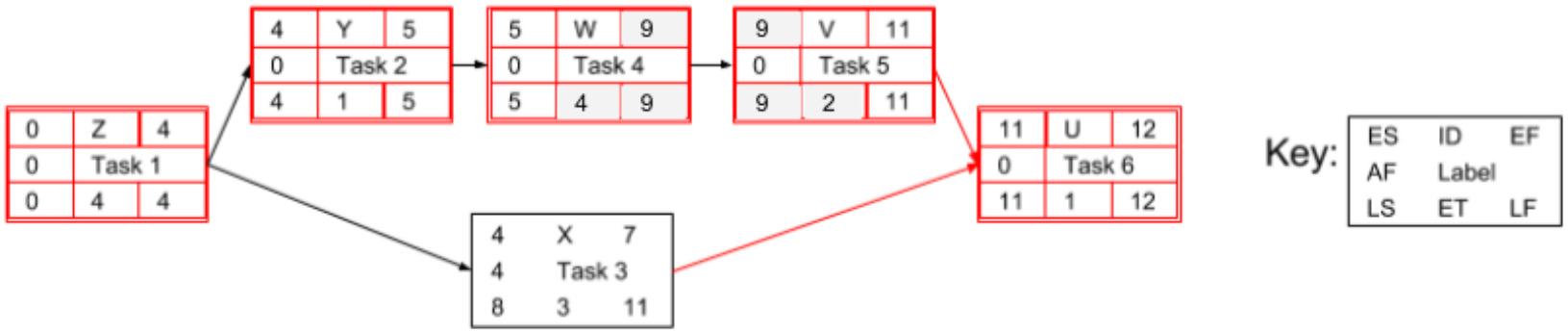
Use a network diagram to determine the Critical Path

ID	Task	Pred.	Expected Time (ET)	ES	EF	LS	LF	Slack	Resource (R_1)
1	Z		4	0	4	0	4	0	6
2	Y	Z	1	4	5	4	5	0	2
3	X	Z	3	4	7	8	11	4	2
4	W	Y	4	5	9	5	9	0	7
5	V	W	2	9	11	9	11	0	3
6	U	V, X	1	11	12	11	12	0	6

Week 09 Lecture covered Critical Path technique.

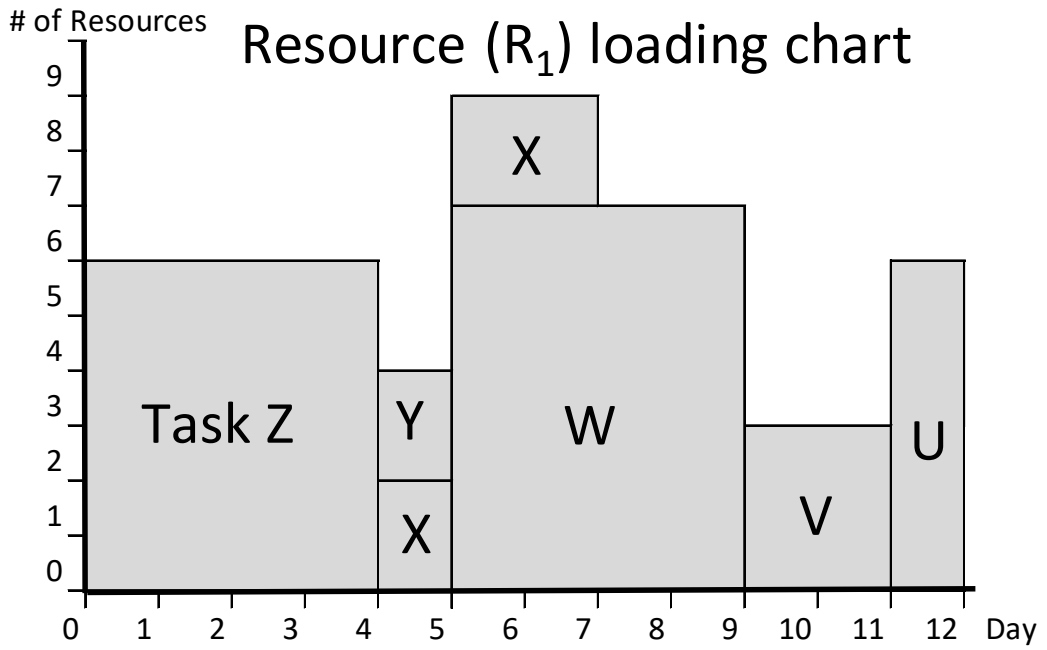
For this example, the Critical Path: Z, Y, W, V, U

This example is used to demonstrate resource levelling.



Example: Project with 6 tasks (U to Z)
Create a Resource load chart

ID	Task	Expected Time (ET)	ES	LF	Slack	Resource (R_1)
1	Z	4	0	4	0	6
2	Y	1	4	5	0	2
3	X	3	4	11	4	2
4	W	4	5	9	0	7
5	V	2	9	11	0	3
6	U	1	11	12	0	6



- Initially schedule all tasks to commence at early start (ES) time.
- Resource (R_1) loading chart shows peak of 9 on days 6 and 7.

Questions: Is this an issue?
If the resource R_1 was Business Analysts (BA's)?
If you only had 7 BA's what then?

Resource Levelling

Resource levelling heuristic.

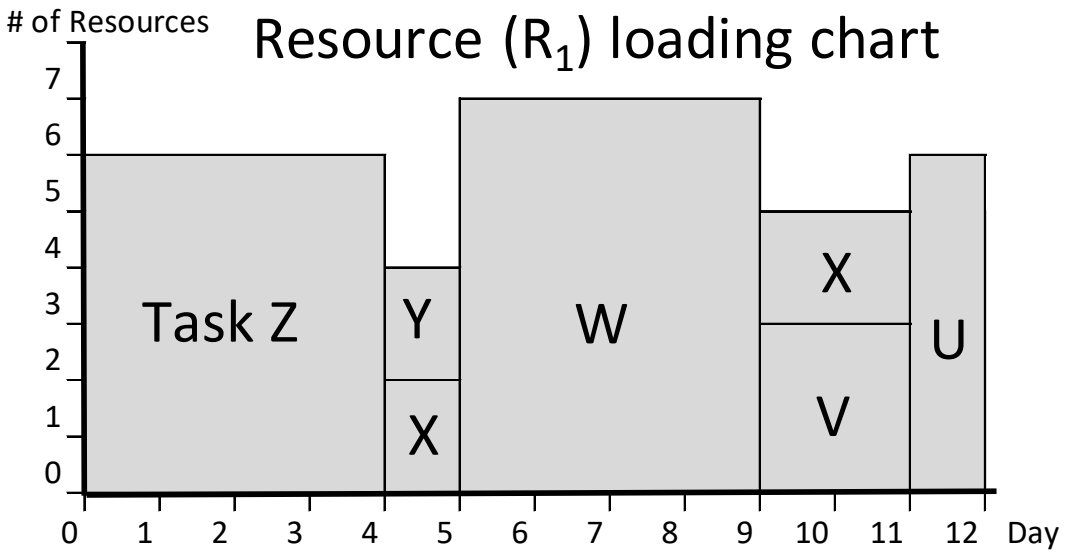
Identify the task to alter in order to level resources. Prioritised rules, start with the task with:

1. Smallest amount of slack.
2. Smallest duration.
3. Lowest ID number - First Come First Served (FCFS).
4. Greatest number of successor tasks.
5. Requiring the most resources.

Heuristic - practical method to solve a problem. It is not guaranteed to be optimal or perfect, but sufficient for the immediate goals.

Example: Project with 6 tasks (U to Z)
Create a Resource load chart

ID	Task	Expected Time (ET)	ES	LF	Slack	Resource (R_1)
1	Z	4	0	4	0	6
2	Y	1	4	5	0	2
3	X	3	4	11	**4**	2
4	W	4	5	9	0	7
5	V	2	9	11	0	3
6	U	1	11	12	0	6



- Using Rule1, Task X has Slack, rearrange activity within the slack to create a more level profile. Splitting Task X creates a more level resource profile.
- Resource (R_1) loading chart for shows peak load of 7 resources

  on days 5 to 9.

Question is this an improvement?

PRINCE2 - Closing a Project (Termination)

Two ways to close a project

- Planned closure - Confirming the completion and acceptance of products (Desirable).
- Premature closure - requested by Project board.

Project closure activities;

- Handover of products to customer.
- Evaluating the project objectives with the actuals and write the End Project Report.
- Send a notification to the Project Board to close the project. Part of a planned project closure after handover and project evaluation.
- Other processes …

Closing a Project (Termination)

Not Part of PRINCE2 methodology.

Termination by Starvation - is not on outright act of termination, but a wilful form of neglect by slowly decreasing project resources to the point where the project cannot remain viable.

Mentioned because this can happen!

- Outside the influence of the Project Manager.
- Can be hard to live with.

Any questions?

Thank you.
See you next week.

PRINCE2 - References

The material presented in weeks 9 and 10 on PRINCE2 are from a number of sources including:

http://prince2.wiki/PRINCE2

https://prince2.co/managing-scope-creep-with-prince2/

https://www.axelos.com/best-practice-solutions/prince2/what-is-prince2

https://en.wikipedia.org/wiki/PRINCE2

Flyvbjerg, B. (2016). How to Get Your Business Case Right, by Using Kahneman's Outside View. Available at SSRN 2769829, 1-16.